Manualslib.com - The Global Manuals Library

PANASONIC CT-24SX11E AP367 SERVICE MANUAL

Quick Links

Service Mode (Electronic Controls)

Table of Contents

service manual
Table of Contents
Exiting the Service Mode
Mode (Back-Open Method)
Service Mode Regiters
Tint/Color Adjustment
Color Temperature Adjustment
chassis service adjustment procedures
replacement parts list
C-Board Voltages
PCB & schematics
A-Board Schematic (Left Portion)
(Right Portion)
A-Board PCB
A-Board Voltages
P-Board schematic
P-Board PCB & voltages
A-Board Waveforms
Other ManualsLib Projects

ORDER NO. MTNC010837A1
B5

Service Manual

Color Television

Simplified

Simplified Manual

(NA8MS)

Panasonic

Models	Chassis
CT-24SX11E	**AP367**
CT-24SX11UE	**AP367**
CT-24SX11CE	**AP367**

This Simplified Service Manual is issued to add listed models to the Main Service Manual order No. **MTNC010527C1** (CT-27SX31E). A set of schematics, unique settings and a complete parts list are included in this Manual**.**
Please file and use this Simplified Service Manual together with Main Service Manual, order No. **MTNC010527C1** (CT-27SX31E).

"**WARNING!** This Service Manual is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. **Products powered by electricity should be serviced or repaired only by experienced professional technicians.** Any attempt to service or repair the product or products dealt with in this Service Manual by anyone else could result in serious injury or death."

The service technician is required to read and follow the "**Safety Precautions**" and "**Important Safety Notice**" in the Main Manual.

Panasonic®

Copyright 2001 by Matsushita Electric Corporation of America. All rights reserved. Unauthorized copying and distribution is a violation of law.

Important Safety Notice

Special components are used in this television set which are important for safety. These parts are identified on the schematic diagram by the symbol ⚠ and printed in **BOLD TYPE** on the replacement part list. It is essential that these critical parts are replaced with the manufacturer's specified replacement part to prevent X-ray radiation, shock, fire or other hazards. Do not modify the original design without the manufacturer's permission.

Safety Precautions

General Guidelines

An **Isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the Receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always Replace Protective Devices, such as fishpaper, isolation resistors and capacitors, and shields after servicing the Receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this Receiver is operating. Operation of the Receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high-voltage equipment.

Extreme care should be practiced when **Handling the Picture Tube**. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. **Discharge the picture tube** by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a well insulated wire or use a grounding probe.

Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to X-ray radiation.

The **Test Picture Tube** used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against X-ray radiation as well as implosion. The magnetic shield limits the X-ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling **50kV** without causing X-ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. **Do not use a line isolation transformer when testing.**

Leakage Current Cold Check

Unplug the AC cord and connect a jumper between the two plug prongs.

Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage Current Hot Check (Fig. 1)

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15μF capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson Model 229, Sencore Model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the Receiver must be repaired and rechecked before it is returned to the customer.

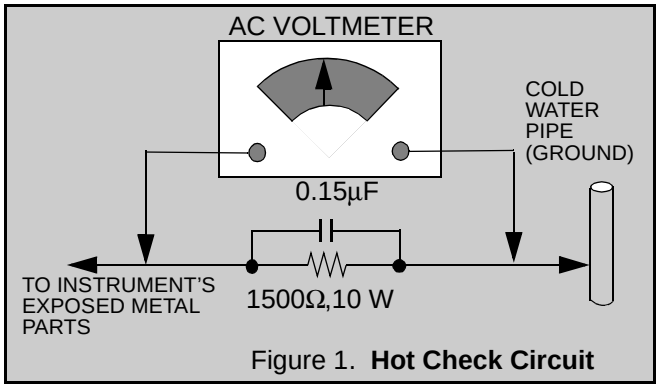


Figure 1. **Hot Check Circuit**

X-ray Radiation

WARNING: The potential source of X-ray radiation in the TV set is in the High Voltage section and the picture tube.

Note: *It is important to use an accurate, calibrated high voltage meter.*

Set the **brightness, picture, sharpness** and **color** controls to Minimum. Measure the High Voltage. The high voltage should be **30.55 ± 1.25kV**. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

Table of Contents

Important Safety Notice 2

Service Notes 4

SPECIFICATIONS

Board Designation Table 4

Receiver Feature Table 5

OPERATION

Location of Controls (Remote) EUR511502 6

SERVICE

Service Mode (Electronic Controls) 7

Exiting the Service Mode 7
Entering Service Mode (Back-Open Method) 7
Service Mode Regiters 8

Service Adjustments (Electronic Controls) 13

Tint/Color Adjustment 13
Color Temperature Adjustment 13

Chassis adjustment procedure 15

Rear View 16

Parts List 18

FOLDOUTS

Schematics, Voltages and waveforms

C-Board Voltages, PCB & schematics 27
A-Board Schematic (Left Portion) 28
(Right Portion) 29
A-Board PCB 30
A-Board Voltages 31
P-Board schematic 32
P-Board PCB & voltages 33
A-Board Waveforms 34

Service Notes (Continued)

IMPORTANT: To protect against possible damage to the solid state devices due to arcing or static discharge, make certain that all ground wires and CTR DAG wire are securely connected.

CAUTION: The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the Receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper groun (⏚) or (⏚) when servicing, or incorrect voltages will be measured.

WARNING: This Receiver has been designed to meet or exceed applicable safety and X-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to X-ray radiation and shock and fire hazard, parts indicated with the symbol ⚠ on the schematic must be replaced with identical parts. Order parts from the manufacturer's parts center using the parts numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specification.

Board Table Description

BOARD	PART NUMBER	BOARD DESCRIPTION
A-BOARD	TNP2AH025CA	Main board
C-BOARD	TNP2AA068AF	CRT panel
P-BOARD	TNP2AH025CA	Power Supply Board

** Note: When ordering a replacement board assembly, append an "S" to the board number.*
Example: To order the A-Board, the replacement board is TNP2AH025CAS.

Receiver Feature Table

FEATURE/MODEL	CT-24SX11E/CE/UE
Chassis	AP367
Tuning system	96K
# of channels	181
Menu language	Eng/Span/Fr
Closed Caption	X
V-Chip	X
75 Ω input	X
Remote Model #	EUR511502
Picture tube	A60LUQ085X
PureFlat Picture Tube	X
Comb Filter	3 Line Digital
V. Edge Correction	X
V/A norm	Both
Color Temp.	X
MTS/SAP/DBX	X
Bass/Treble/Balance	X
Surround Sound	X
AI Sound	X
Spatializer/BBE	BBE
FAO & VAO	X
Built-in audio power	7Wx2 (10%)
# of speakers	2
A/V in (rear/front)	3(2/1)
Component Input	1(1/0)
S-VHS Input (rear/front)	1/1
Headphone Jack	X
Dimensions mm **(WxDxH) in**	550x479x491.5 21.7 x 18.9 x 19.4
Weight (kg/lbs)	35/77.16
Power source (V/Hz)	120/60
Anode voltage	30.55kV ± 1.25kV
Video input jack	$1V_{p-p}$ 75Ω, phono jack
Audio input jack	500mV RMS 47kΩ

Table 1. **Receiver Features**

Specifications are subject to change without notice or obligation.
Dimensions and weights are approximate.

Location of Controls (Remote)

POWER Button
Press to turn ON and OFF.
MUTE Button
Press to mute sound. A second press resumes sound. Press also to access and delete Closed Caption display.
VCR, DVD, LD/CD, AUX, TV, CBL, DBS, RCVR
Component function buttons
VOL (volume) Buttons
Press to adjust TV sound level. Use with Channel buttons to navigate in menus.
R-TUNE (Rapid Tune) Button.
Press to switch to the previous channel.
ACTION Button
Press to display Main Menu and access or exit On Screen features and Adjustment Menus.
REW, PLAY, FF, TV/VCR, STOP, PAUSE, REC, VCR CHANNEL
Component function buttons.
TV/VIDEO Button
Press to select TV or Video input.
CH (channel) Buttons
Press to select channels. Use with volume buttons to navigate in menus.

EUR511502

Figure 2. **Location of Controls (Remote).**

Service Mode (Electronic Controls)

This Receiver has electronic technology using the I²C Bus Concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed by using “On Screen Display Menu”. (The **Service Adjustment Mode**.)

Note: *It is suggested that the technician reads all the way through and understand the following procedure for Entering/Exiting the **Service Adjustment Mode**; then proceed with the instructions working with the Receiver. When becoming familiar with the procedure, the Flow Chart for Service Mode may be used as a quick guide.*

Quick Entry to Service Mode:

At times when minor adjustments need to be done to the electronic controls, the method of Entering the service Mode without removal of the cabinet back is as follows using the Remote Control:

1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Press ACTION button 3 times to exit menus.
4. Tune to the Channel 124.
5. Adjust VOLUME to minimum (0).
6. Press the VOL ◀ button (decrease) **on Receiver**. Red “CHK” appears in upper corner.

To toggle between Aging and Service modes:

While the “CHK” is displayed on the left top corner of the CRT, pressing the Action and the Volume Up buttons on the Receiver simultaneously will toggle between the modes. Red “CHK” for Service and yellow “CHK” for Aging.

7. **Press** the **Power** Button on the **Remote Control** to select one of the Service Adjustment Modes.
   1) **B** Service VCJ SUB-DATA ADJUSTMENT.
   2) **C** Service VCJ CUT-OFF ADJUSTMENT.
   3) **D** Service GEOMETRY ADJUSTMENT.
   4) **M** Service MTS ADJUSTMENTS.
   5) **P** Service PIP ADJUSTMENT.
   6) **S** Service S OPTION ADJUSTMENTS.
   7) **X** Service COMB FILTER ADJUSTMENT.
   8) **E** Service AUDIO ADJUSTMENTS
   9) “**CHK**” = Normal operation of CHANNEL ▲▼ and VOLUME ◀ ▶.

Note: *Only the applicable settings for the Receiver serviced will be available (See* **a** *in Fig. 3).*

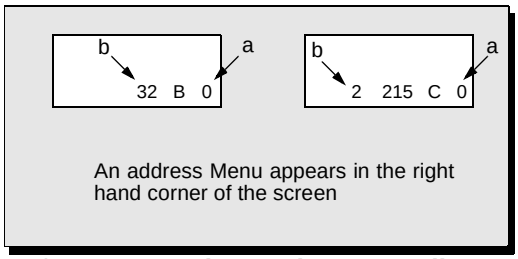


Figure 3. **Service Mode Menu Adjustments.**

Exiting the Service Mode:

Press the **Action** and the **Power** buttons on the **Receiver** simultaneously for at least 2 seconds.

THE RECEIVER EXITS SERVICE MODE.

The Receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound. Any programmed channels, channels caption data and some others user defined settings will be erased.

IMPORTANT NOTE:
Always Exit the Service Mode Following Adjustments.

Press the **Power Button** on the **Remote Control** to select the Service Adjustment.

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 3).

Note: *Write Down the original value set (**b** in* Fig. 3*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 3).

Sub-Data Adjustment		Default Level
B00	SUB-COLOR	27
B01	SUB-TINT	40
B02	SUB-BRIGHTNESS	40
B03	SUB-CONTRAST	6
B04	SUB-TINT VIDEO	10
B05	SUB-COLOR VIDEO	22
B06	SUB-TINT COMP	68
B07	SUB-COLOR COMP	28
B08	SUB SHARP TV/VIDEO	10
B09	SUB SHARP S-VHS/COMP	17
B0A	SUB-CONTRAST FIXED	15

Cut-Off Adjustment		Default Level
C00	CUT-OFF R	128
C01	CUT-OFF G	128
C02	CUT-OFF B	128
C03	BRIGHTNESS	31
C04	G DRIVE	64
C05	B DRIVE	64
C06	DRIVE C TEMP	8
C07	CONT C TEMP	5
C08	CUTOFF R COMP	100
C09	CUTOFF G COMP	127
C0A	CUTOFF B COMP	100

IMPORTANT NOTE:
Always Exit the Service Mode Following Adjustments.

To D Items.

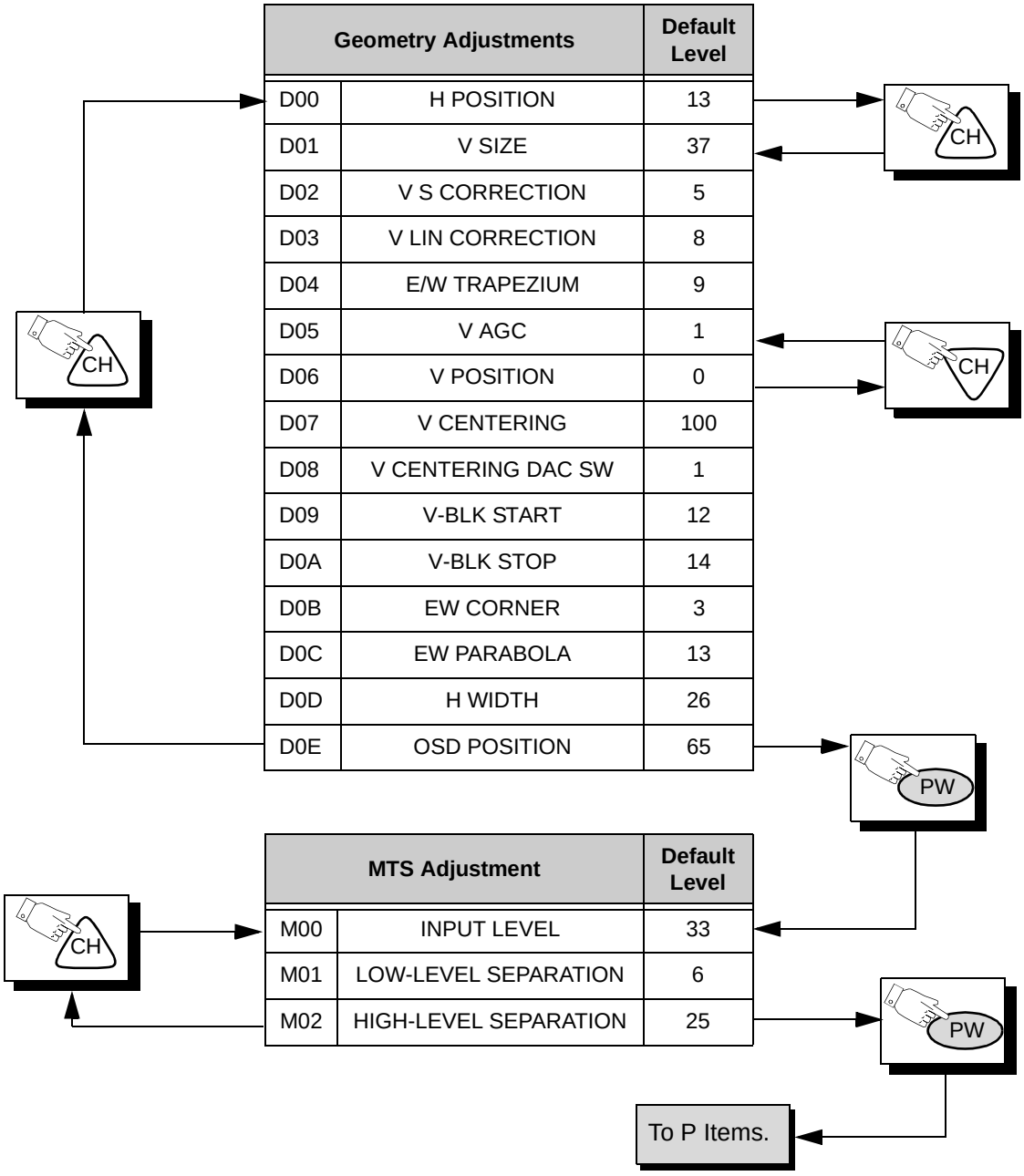
Press the Power Button on the Remote Control to select the Service Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 3).

Note: *Write Down the original value set (**b** in* Fig. 3*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 3).



Geometry Adjustments		Default Level
D00	H POSITION	13
D01	V SIZE	37
D02	V S CORRECTION	5
D03	V LIN CORRECTION	8
D04	E/W TRAPEZIUM	9
D05	V AGC	1
D06	V POSITION	0
D07	V CENTERING	100
D08	V CENTERING DAC SW	1
D09	V-BLK START	12
D0A	V-BLK STOP	14
D0B	EW CORNER	3
D0C	EW PARABOLA	13
D0D	H WIDTH	26
D0E	OSD POSITION	65

MTS Adjustment		Default Level
M00	INPUT LEVEL	33
M01	LOW-LEVEL SEPARATION	6
M02	HIGH-LEVEL SEPARATION	25

Note: *Some adjustment modes may not be available in some formats.*

IMPORTANT NOTE:
Always Exit the Service Mode Following Adjustments.

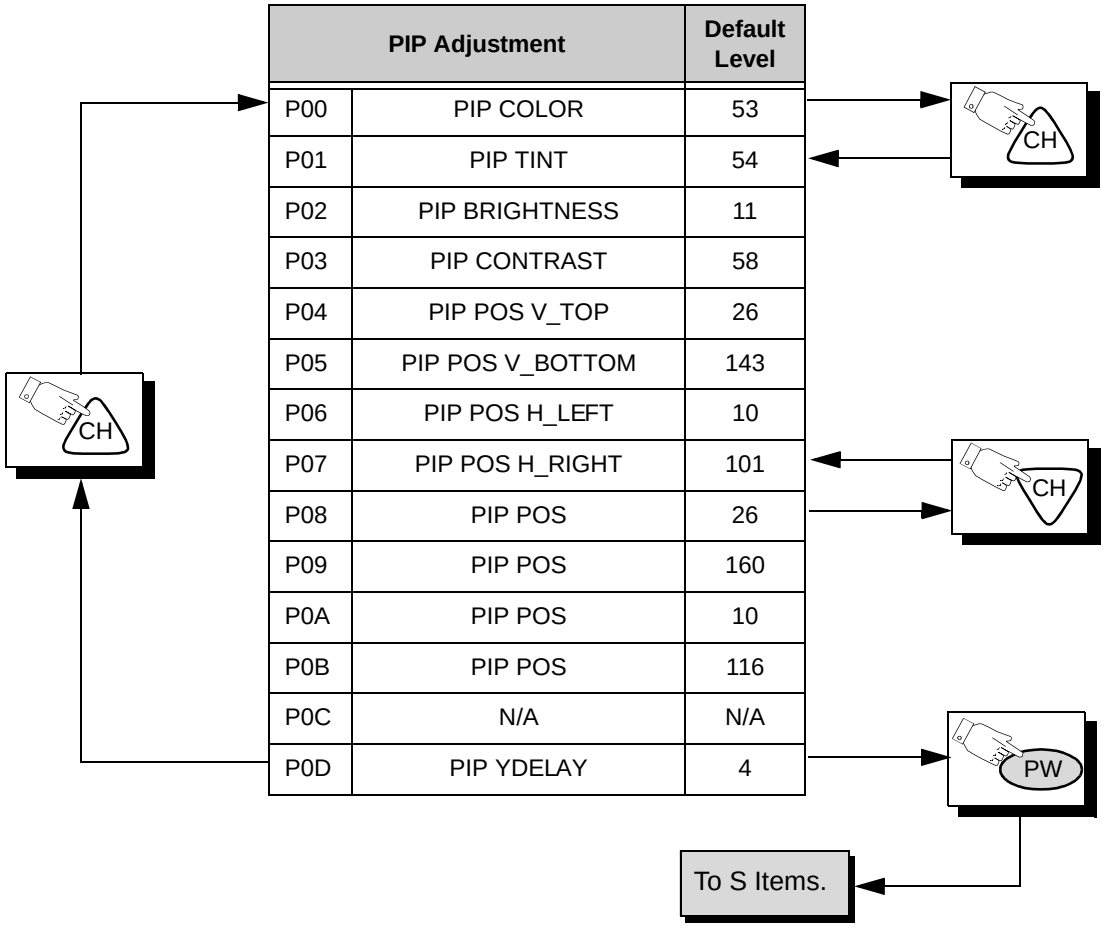
Press the Power Button on the Remote Control to select the Service Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 3).

Note: *Write Down the original value set (**b** in* Fig. 3*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 3).



PIP Adjustment		Default Level
P00	PIP COLOR	53
P01	PIP TINT	54
P02	PIP BRIGHTNESS	11
P03	PIP CONTRAST	58
P04	PIP POS V_TOP	26
P05	PIP POS V_BOTTOM	143
P06	PIP POS H_LEFT	10
P07	PIP POS H_RIGHT	101
P08	PIP POS	26
P09	PIP POS	160
P0A	PIP POS	10
P0B	PIP POS	116
P0C	N/A	N/A
P0D	PIP YDELAY	4

Note: *Some adjustment modes may not be available in some formats.*

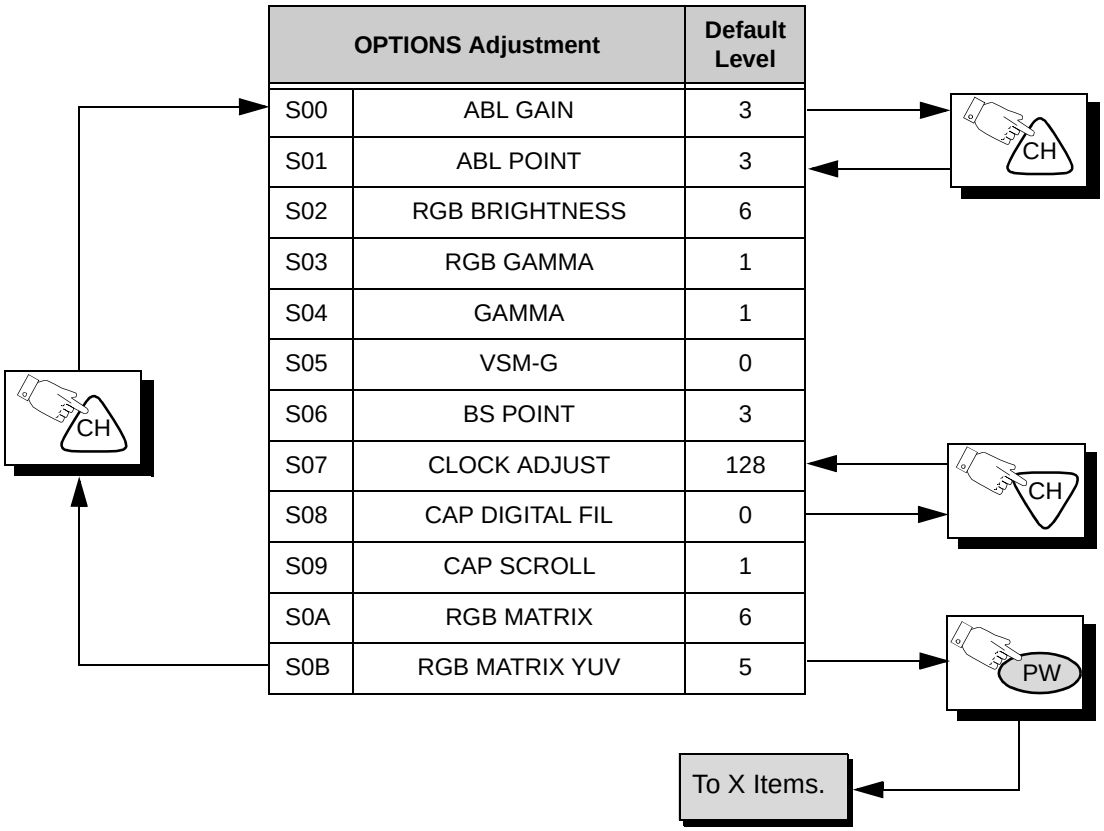
Press the Power Button on the Remote Control to select the Service Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 3).

Note: *Write Down the original value set (**b** in* Fig. 3*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 3).



OPTIONS Adjustment		Default Level
S00	ABL GAIN	3
S01	ABL POINT	3
S02	RGB BRIGHTNESS	6
S03	RGB GAMMA	1
S04	GAMMA	1
S05	VSM-G	0
S06	BS POINT	3
S07	CLOCK ADJUST	128
S08	CAP DIGITAL FIL	0
S09	CAP SCROLL	1
S0A	RGB MATRIX	6
S0B	RGB MATRIX YUV	5

IMPORTANT NOTE:
Always Exit the Service Mode Following Adjustments.

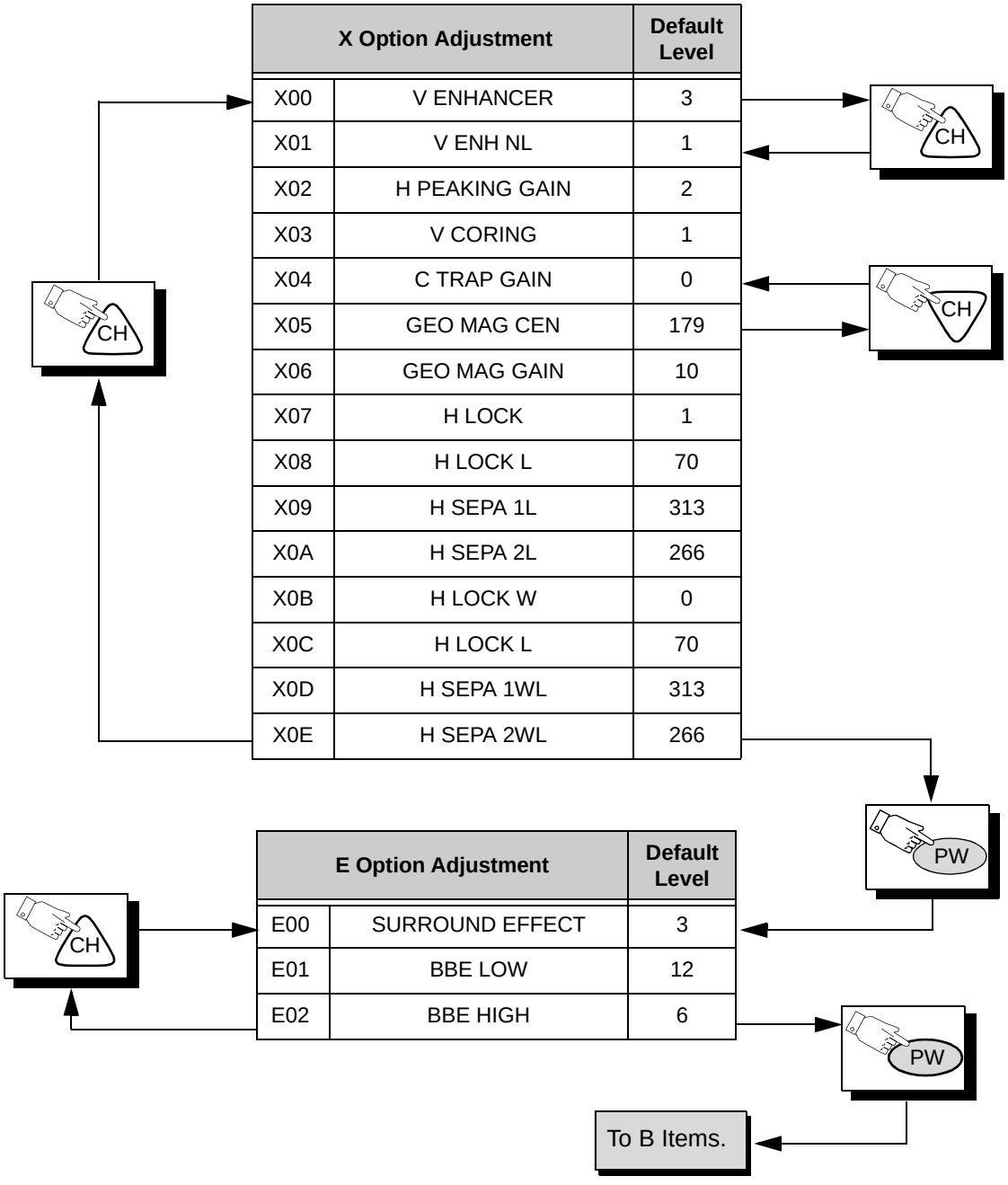
Press the Power Button on the Remote Control to select the Service Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 3).

Note: *Write Down the original value set (**b** in* Fig. 3*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 3).



X Option Adjustment		Default Level
X00	V ENHANCER	3
X01	V ENH NL	1
X02	H PEAKING GAIN	2
X03	V CORING	1
X04	C TRAP GAIN	0
X05	GEO MAG CEN	179
X06	GEO MAG GAIN	10
X07	H LOCK	1
X08	H LOCK L	70
X09	H SEPA 1L	313
X0A	H SEPA 2L	266
X0B	H LOCK W	0
X0C	H LOCK L	70
X0D	H SEPA 1WL	313
X0E	H SEPA 2WL	266

E Option Adjustment		Default Level
E00	SURROUND EFFECT	3
E01	BBE LOW	12
E02	BBE HIGH	6

Tint/Color Adjustment

Service DAC Adjustment (B01) (B00)

Preparation:

1. Apply a rainbow color bar signal.
2. Preset the following controls:
   - Brightness . . . . . .Min.
   - Color . . . . . .Center.
   - Tint. . . . . .Center.
   - Picture . . . . . .Max.
   - Sharpness . . . . . .Min.
3. Set RGB GAMMA (S03) DAC to 0
4. Connect a jumper from TPD2 to GND (⏚).

Procedure:

1. Connect the oscilloscope to TP47B (A-Board).
2. In the Service Mode, select (B01) DAC Sub-Tint Adjustment. Adjust until the waveform measured is as the one shown in Fig. 25.

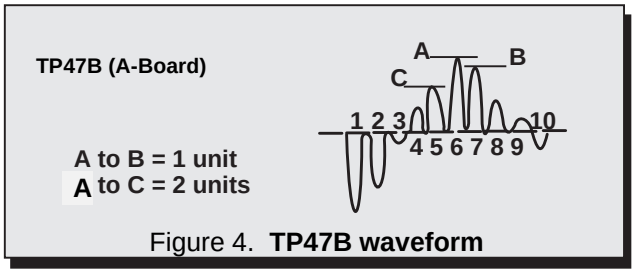


Figure 4. **TP47B waveform**

3. Connect the oscilloscope to TP47R (TPL1) and cold GND.
4. Select DAC Sub-Color Adjustment (B00) and adjust for peak to peak amplitude to be **0.95Vp-p ±0.1V** as shown in Fig. 26.

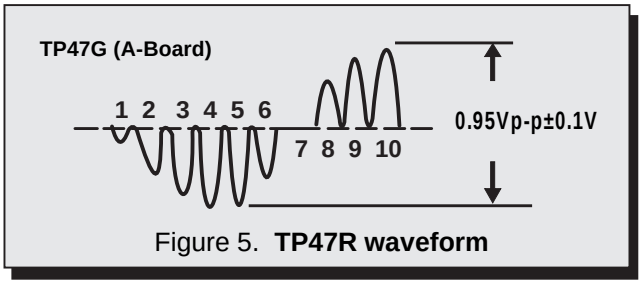


Figure 5. **TP47R waveform**

Remove short jumper and set RGB GAMMA (S03) DAC to 1.

Color Temperature Adjustment (B/W Tracking)

Service DAC Adjust.
(C00) (C01) (C02) (C04) (C05)
Minor Touch-Up Method

OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for "good gray scale and warm highlights".

1. LOW LIGHT areas – In Service Mode for making electronic adjustments, select Cutoff (C00) RED, (C01) GRN, (C02) BLU and adjust the picture for gray.
2. HIGH LIGHT areas – In Service Mode for making electronic adjustments, select Drive (C04) GRN, (C05) BLU and adjust the picture for warm whites.

Complete Adjustment

Preparation:

1. Turn the Receiver "ON" and allow 30 minutes warm up at high brightness.
2. Apply a color bar signal with color "OFF".
3. Turn the SCREEN control (part of FBT T551) fully counterclockwise.

Procedure:

Preset the following Service DACs for best results:

- C0 128
- C1 128
- C2 128
- C4 64
- C5 64

1. Connect the oscilloscope to TPL1 (C-Board).
2. In Service Mode, select the Sub-Bright DAC (B02).
3. Press the R-Tune key on the remote.
4. Observe the oscilloscope waveform at Horizontal rate and adjust the Service Mode Sub-Bright DAC (B02) level until a scanning period of **2.4V** above DC ground is measured, as indicated in Fig. 28.

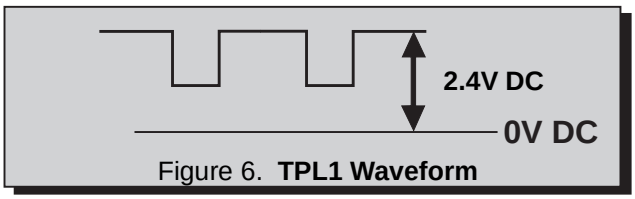


Figure 6. **TPL1 Waveform**

5. Press the R-Tune key on the remote.
6. Connect the scope to RED Cathode (KR) on the CRT-Board.
7. In the Service Mode, select the RED CUTOFF DAC (C00).
8. Press the R-Tune key on the remote.
9. View scope trace at Horizontal rate and adjust the Service Mode DAC (C00) level until a scanning period of **170V** above DC ground is measured, as indicated in Fig. 29.
10. Press the R-Tune key on the remote.
11. Write the same C00 data to C01 and C02.
12. Press the R-Tune key on the remote.
13. Turn the Screen Control (part of FBT) slowly clockwise until a slightly color horizontal line appears.
14. Adjust DAC C01 and C02 until the horizontal line becomes white.

15. Press the R-Tune key on the Remote

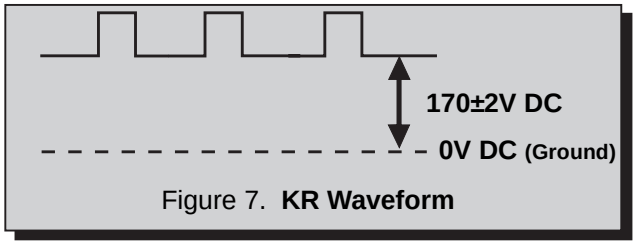


Figure 7. **KR Waveform**

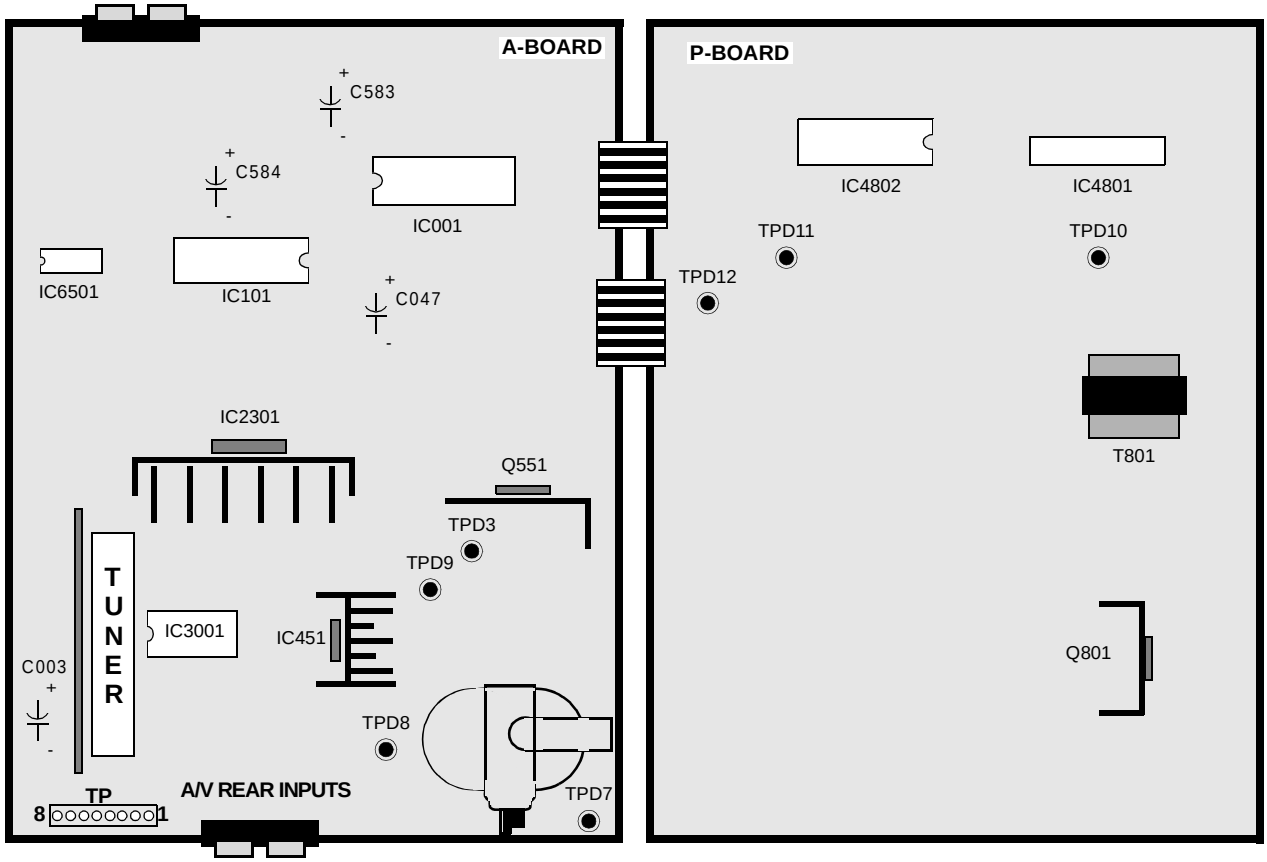
16. In the Service Mode select the DAC DRIVE adjustments (C04) GRN, (C05) BLUE and adjust for warm white in a white color bar pattern.
17. Apply a monoscope pattern and check for a good picture.
18. Perform Minor Touch-Up Method if necessary.

EXIT the Service Mode

Chassis Service Adjustment Procedures

All service adjustments are factory preset and should not require adjustment unless controls and/or associated components are replaced.

Note: *Connect the (-) lead of the voltmeter to the appropriate ground. Use heat sink when the HOT ground symbol (⏚) is used. Otherwise, use COLD ground (⏚) — Tuner shield.*



140.0V B+ Voltage Confirmation

1. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu.
2. Connect the DVM between **TPP12** (+ side) and cold ground (⏚). (In P-Board).
3. Confirm that B+ voltage is **140.0V ± 1.5V**. This voltage supplies B+ to the Horizontal Output & Flyback circuits.

P-Board B+ Voltages

120V AC line input. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu. Use cold ground (⏚) for the (-) lead of the DVM.

.

LOCATION (P-Board)		VOLTAGE Board connected	VOLTAGE Board w/o connect
TPP12	B+	140.0V ± 1.5V	90.0V ± 9V
TPP11	*STBY 12*	13.0V ± 2V	8.2V ± 1V
TPP10	*SOUND*	33.0V ± 5V	25.0V ± 3V
For Sound GND use connector P1-pin 5			

A-Board B+ Voltages

120V AC line input. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu. Use cold ground (⏚) for the (-) lead of the DVM.

LOCATION (A-Board)		VOLTAGE
C584 (+)	*MAIN 9*	9.0V ± 0.5V
C583 (+)	*MAIN 5*	5.0V ± 0.3V
TPD9	*MAIN -15*	-15V ± 2V
TPD3	*MAIN 15*	15V ± 2V
TPD8	*MAIN 7.5*	7.1V ± 1.0V
C047 (+)	*ST-BY*	3.3V ± 0.2V
TPD7	*MAIN 220*	220V ± 9.0V

Adjust Picture Menu for normalized video adjustments.

Rear View

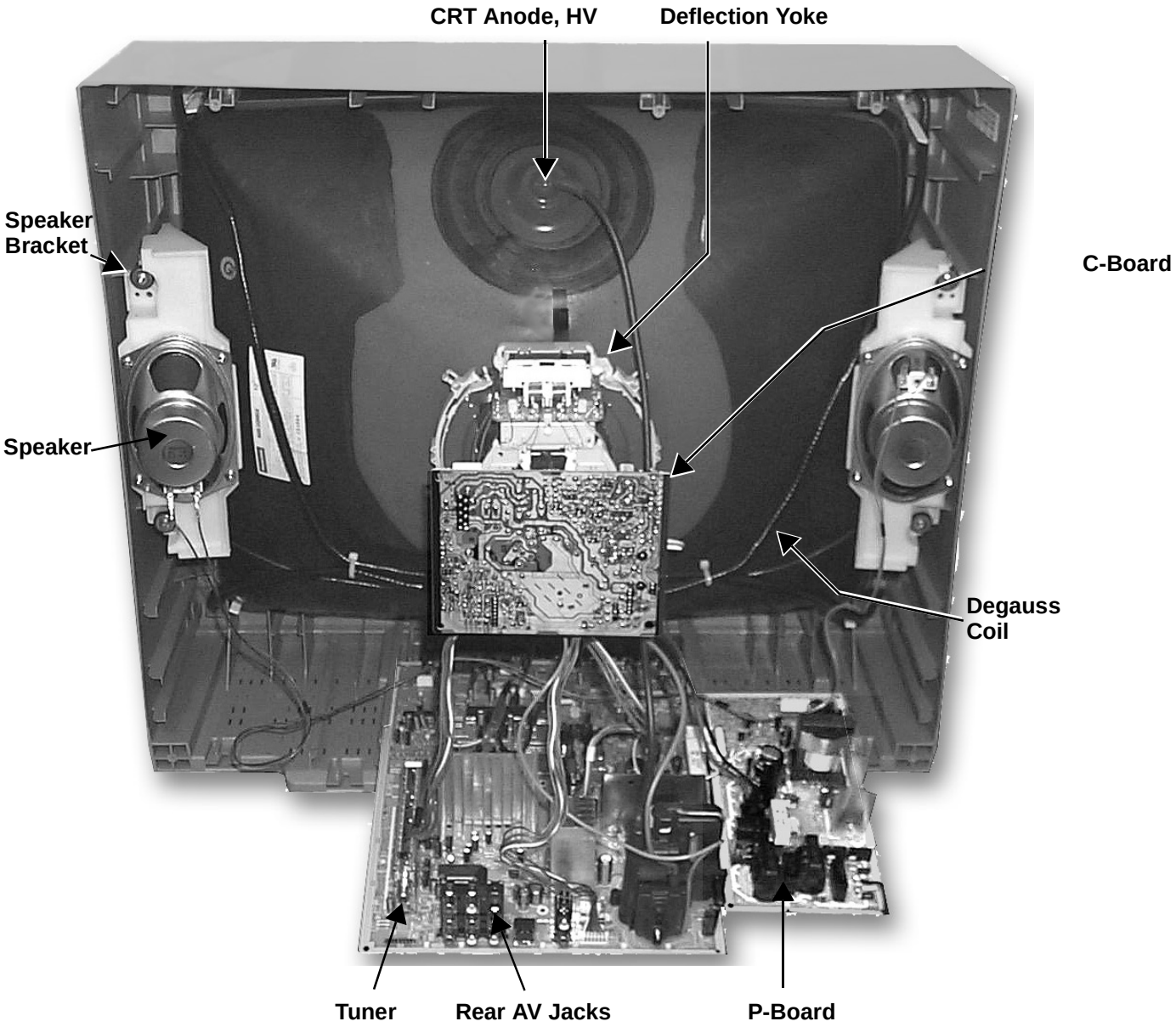


Figure 8. CT-24SX11E/CE/UE Rear View

NOTES:

REPLACEMENT PARTS LIST

Model:CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
	CAPRISTORS	
CRA801	**TP00842-51**	**TAPING GAP TERMINAL**
CRA802	**TP00842-51**	**TAPING GAP TERMINAL**
	CAPACITORS	
C001	ECA1CM470B	CAP,E 47UF/16V
C002	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C003	ECEA1HKA4R7B	CAP,E 4.7UF-50V
C005	ECA1CM470B	CAP,E 47UF/16V
C006	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C008	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C010	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C013	ECA0JM101B	CAP,E 100UF-6.3V
C014	TCJ2VC1H390J	CAP,C 39PF-J-50V
C015	TCJ2VC1H120J	CAP,C 12PF-J-50V
C017	TCJ2VC1H270J	CAP,C 27PF-J-50V
C018	TCJ2VC1H270J	CAP,C 27PF-J-50V
C020	ECA0JM331B	CAP,E 330UF-6.3V
C021	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C024	ECA1HM4R7B	CAP,E 4.7UF-50V
C025	ECA1HM010B	CAP,E 1UF-50V
C026	ECA1HM010B	CAP,E 1UF-50V
C032	ECA1CM331B	CAP,E 330UF-16V
C033	TCJ2VC1H680J	CAP,C 68PF-J-50V
C034	TCJ2VC1H680J	CAP,C 68PF-J-50V
C043	ECA1HM2R2B	CAP,E 2.2UF-50V
C044	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C047	ECA0JM102B	CAP,E 1000UF-6.3V
C048	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C201	TCJ2VB1C104K	CAP,C .1UF-K-16V
C224	TCJ2VB1C104K	CAP,C .1UF-K-16V
C225	TCJ2VB1C104K	CAP,C .1UF-K-16V
C226	TCJ2VB1C104K	CAP,C .1UF-K-16V
C301	TCJ2VB1C104K	CAP,C .1UF-K-16V
C302	TCJ2VB1C104K	CAP,C .1UF-K-16V
C303	TCJ2VB1C104K	CAP,C .1UF-K-16V
C307	ECA1HM0R1B	CAP,E 0.1UF/50V
C310	TCJ2VC1H390J	CAP,C 39PF-J-50V
C315	EEANA1E1R0B	CAP,E 1.0UF-25V
C320	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C321	TCJ2VB1H103K	CAP,C .01UF-K-50V
C322	TCJ2VB1H103K	CAP,C .01UF-K-50V
C323	TCJ2VB1H103K	CAP,C .01UF-K-50V
C324	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C330	ECA1AM101B	CAP,E 100UF-10V
C331	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C337	ECA1HM2R2B	CAP,E 2.2UF-50V
C342	ECA1HM010B	CAP,E 1UF-50V
C351	TACCV470T50V	CAP,C 47PF/50V
C352	TACCV330T50V	CAP,C 33PF/50V
C353	TACCV330T50V	CAP,C 33PF/50V
C359	ECQM4104KZB	CAP,P .10UF-K-400V

REF NO.	PART NO.	DESCRIPTION
C368	ECQV1H224JL3	CAP,P .22UF-J-50V
C370	ECKW3D102KBN	CAP,C .001UF-K-2KVDC
C371	ECEA1HN010UB	CAP,E 1UF/50V
C373	ECA2EHG100B	CAP,E 10UF-250V
C377	ECA1CM221B	CAP,E 10UF-16V
C401	TCJ2VB1C104K	CAP,C .1UF-K-16V
C402	TCJ2VB1H102K	CAP,C 1000PF-K-50V
C403	ECA1HM010B	CAP,E 1UF-50V
C404	ECA1HM010B	CAP,E 1UF-50V
C405	ECSF1EE105VB	CAP,E 1.0UF-25V
C407	ECA1HM220B	CAP,E 22UF-50V
C409	TCJ2VC1H101J	CAP,C 100PF-J-50V
C410	TCJ2VB1C104K	CAP,C .1UF-K-16V
C415	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C453	EEUNA1E220B	CAP,E 22UF-25V
C454	ECA1HHG221B	CAP,E 220UF-50V
C456	ECQB1104JF3	CAP,P .10UF-J-100V
C458	ECKR1H221KB5	CAP,C 220PF-K-50V
C459	ECQB1224KF3	CAP,P .22UF-K-100V
C460	ECA1VM221B	CAP,E 220UF-35V
C461	ECA1VM470B	CAP,E 47UF/35V
C462	ECA1VM221B	CAP,E 220UF-35V
C463	ECQB1H103JM3	CAP,P .01UF-J-50V
C465	ECA1CM101B	CAP,E 100UF/16V
C470	ECQB1H104JM3	CAP,P .1UF-J-50V
C471	ECQB1H104JM3	CAP,P .1UF-J-50V
C495	ECQB1H683JM3	CAP,P .068UF-J-50V
C504	ECQB1H222JM3	CAP,P 2200PF-J-50V
C505	TCJ2VC1H180J	CAP,C 18PF-J-50V
C506	ECA1CM471B	CAP,E 470UF-16V
C507	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C511	ECKR2H271KB5	CAP,C 270PF-K-500W
C512	ECKR2H152KB5	CAP,C .0015UF-K-500V
C514	ECA1HMR22B	CAP,E .22UF-50V
C519	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C535	TCJ2VC1H120J	CAP,C 12PF-J-50V
C548	**ECWH16103JVB**	**CAP,P .01UF-J-1.5KV**
C549	**ECQM4473JZW**	**CAP,P .047UF-J-400V**
C550	**ECA160V33UE**	**CAP,E 33UF/160V**
C552	**ECQM6332JZW**	**CAP,P .63UF-J-100V**
C553	ECWF2754JBB	CAP,M .27UF-J-200V
C554	**ECKW3D102KBR**	**CAP,C 1000PF-K-2KV**
C555	ECA160V33UE	CAP,E 33UF/160V
C556	**ECWH20102JVY**	**CAP,P 1000PF-J-2KV**
C557	ECA1CM100B	CAP,E 10UF-16V
C558	**ECKW3D561JBR**	**CAP,C 560PF-J-2KV**
C559	ECKW3D681KBP	CAP,C 680PF-K-2KV
C560	ECKR2H102KB5	CAP,C 1000PF-K-500V
C561	**ECQB1H273JM3**	**CAP,M .27UF-J-50V**
C562	ECKR2H471KB5	CAP,C 470PF-K-500W
C563	**ECA1EM102E**	**CAP,E 1000UF-25V**

REPLACEMENT PARTS LIST

Model: CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C564	ECKR2H471KB5	CAP,C 470PF-K-500W
C565	**ECA1EM102E**	**CAP,E 1000UF-25V**
C566	ECKR2H471KB5	CAP,C 470PF-K-500W
C567	**ECA1CM471B**	**CAP,E 470UF-16V**
C569	**ECWF2304JBB**	**CAP,M .3UF-J-200V**
C570	**ECA2EM220E**	**CAP,E 22UF-250V**
C571	ECKR2H102KB5	CAP,C 1000PF-K-500V
C572	**ECWF2334JBB**	**CAP,P .33UF-J-200V**
C573	ECQE2474KFW	CAP,P .47UF-K-200V
C580	**ECA1HM4R7B**	**CAP,E 4.7UF-50V**
C581	ECA1CM471B	CAP,E 470UF-16V
C582	ECA1CM101B	CAP,E 100UF/16V
C583	ECA1CM100B	CAP,E 10UF-16V
C593	ECEA1HNR47UB	CAP,E .47UF-50V
C595	ECA1HM100B	CAP,E 10UF/50V
C601	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C603	ECQB1H223JM3	CAP,P .022UF-J-50V
C616	TCJ2VB1C104K	CAP,C .1UF-K-16V
C619	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C628	TCJ2VC1H151J	CAP,C 150PF-J-50V
C632	TCJ2VB1H103K	CAP,C .01UF-K-50V
C641	ECA1CM100B	CAP,E 10UF-16V
C701	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C750	TCJ2VC1H181J	CAP,C 180PF-J-50V
C751	**ECQE1335KFB**	**CAP,P 3.3UF-K-100V**
C752	ECA1VM470B	CAP,E 47UF/35V
C753	ECQB1H222JM3	CAP,P 2200PF-J-50V
C754	TCJ2VB1H332K	CAP,C .0033UF-K-50V
C755	TCJ2VB1H273K	CAP,C .027UF-K-50V
C756	ECKR2H332KB5	CAP,C 3300PF-K-550V
C757	TCJ2VB1H682K	CAP,C 6800PF-K-50V
C763	ECKR3A121KBP	CAP,C 120PF-K-1KV
C801	**ECKWAE472ZED**	**CAP,C 4700PF-Z-500V**
C802	**ECKWAE472ZED**	**CAP,C 4700PF-Z-500V**
C803	**ECKWAE472ZED**	**CAP,C 4700PF-Z-500V**
C804	**ECKWAE472ZED**	**CAP,C 4700PF-Z-500V**
C805	**EC0S2DA561BB**	**CAP,E 560PF-200V**
C806	ECQB1H104JM3	CAP,P .1UF-J-50V
C807	ECQB1H103JM3	CAP,P .01UF-J-50V
C809	ECKR3A222KBP	CAP,C .0022UF-K-1KV
C812	**ECQU2A224MVA**	**CAP,P .22UF-M-250VAC**
C813	**ECQU2A153MVA**	**CAP,P .015UF-M-250VAC**
C814	**ECQU2A153MVA**	**CAP,P .015UF-M-250VAC**
C815	ECQB1H104JM3	CAP,P .1UF-J-50V
C816	ECQB1H473JM3	CAP,P .047UF-J-50V
C817	**ECQU2A224MVA**	**CAP,P .22UF-M-250VAC**
C818	ECQB1H103JM3	CAP,P .01UF-J-50V
C819	**ECKCNB102MB**	**CAP,C 1000PF-M-250V**
C820	**ECKCNB102MB**	**CAP,C 1000PF-M-250V**
C821	**ECA1HM471E**	**CAP,E 470UF-50V**
C822	ECKR3A471KBP	CAP,C 470PF-K-1KV

REF NO.	PART NO.	DESCRIPTION
C823	ECA1CHG101B	CAP,E 100UF-16V
C824	ECKR3A821KBP	CAP,C 820PF-K-1KV
C825	**EEUMG2C221S**	**CAP,E 220UF-160V**
C826	ECKR3A821KBP	CAP,C 820PF-K-1KV
C827	**ECA1CM102B**	**CAP,E 1000UF/16V**
C828	ECKR1H471KB5	CAP,C 470PF-K-50V
C831	ECKR3A221KBP	CAP,C 220PF-K-1KV
C832	ECKR3A471KBP	CAP,C 470PF-K-1KV
C833	ECA1HM4R7B	CAP,E 4.7UF-50V
C835	**ECA1EM101B**	**CAP,E 100UF-25V**
C901	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C902	TCJ2VC1H561J	CAP,C 560PF-J-50V
C904	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C952	ECA1HM100B	CAP,E 10UF/50V
C953	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C958	ECA2CM470E	CAP,E 47UF-160V
C959	ECKW2H103ZF7	CAP,C .01UF-Z-500V
C960	ECCR2H151J5	CAP,C 150-500V
C961	ECA2AM100B	CAP,E 10UF-100V
C962	ECKW2H103ZF7	CAP,C .01UF-Z-500V
C963	ECCR1H151J5	CAP DISC 150-5-50V
C964	ECA1CHG101B	CAP,E 100UF-16V
C966	ECA1CHG101B	CAP,E 100UF-16V
C967	ECA1CM221B	CAP,E 10UF-16V
C968	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C969	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C971	TACCW222T50V	CAP,C 2200PF/50V
C2202	ECA1HM2R2B	CAP,E 2.2UF-50V
C2203	ECA1HM4R7B	CAP,E 4.7UF-50V
C2204	AP106K016CAE	CAP,T 10UF/16V
C2205	ECA1HM010B	CAP,E 1UF-50V
C2206	ECQB1H223JM3	CAP,P .022UF-J-50V
C2207	AP335K016CAE	CAP,T 3.3UF/16V
C2208	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2209	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2210	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2211	ECA1CM100B	CAP,E 10UF-16V
C2212	ECQB1H473JM3	CAP,P .047UF-J-50V
C2215	ECA0JM101B	CAP,E 100UF-6.3V
C2218	ECA1HMR47B	CAP,E .47UF-50V
C2220	TCJ2VC1H100D	CAP,C 10PF-J-50V
C2302	ECA1HM010B	CAP,E 1UF-50V
C2305	ECA1HM010B	CAP,E 1UF-50V
C2307	ECA1EM102E	CAP,E 1000UF-25V
C2308	ECA1HM101B	CAP,E 100UF-50V
C2311	ECA1HM010B	CAP,E 1UF-50V
C2312	ECA1EM102E	CAP,E 1000UF-25V
C2313	ECA1VM102E	CAP,E 1000UF-35V
C2314	ECA1CM101B	CAP,E 100UF/16V
C2331	ECA1HM010B	CAP,E 1UF-50V
C2332	ECA1HM010B	CAP,E 1UF-50V

REPLACEMENT PARTS LIST

Model:CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C2333	ECA1EM100B	CAP,E 10UF-25V
C2334	ECA1EM100B	CAP,E 10UF-25V
C2335	ECA1HM010B	CAP,E 1UF-50V
C2336	ECA1HM010B	CAP,E 1UF-50V
C2337	ECA1CM470B	CAP,E 47UF/16V
C2431	ECA1HM010B	CAP,E 1UF-50V
C2432	ECA1HM010B	CAP,E 1UF-50V
C2433	TCJ2VC1H222J	CAP,C 2200PF-J-50V
C2437	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2438	TCJ2VB1H102K	CAP,C 1000PF-K-50V
C2444	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2445	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2449	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2450	TCJ2VB1H102K	CAP,C 1000PF-K-50V
C2451	ECEA1CN100UB	CAP,E 10UF-16V
C2459	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2460	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2461	ECA1HM4R7B	CAP,E 4.7UF-50V
C2462	ECA1HM4R7B	CAP,E 4.7UF-50V
C2463	ECEA1CN100UB	CAP,E 10UF-16V
C2464	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2465	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2468	ECA1AM101B	CAP,E 100UF-10V
C2473	ECA1HM4R7B	CAP,E 4.7UF-50V
C2474	ECA1AM101B	CAP,E 100UF-10V
C2475	ECA1HM4R7B	CAP,E 4.7UF-50V
C3001	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3002	ECA1AM101B	CAP,E 100UF-10V
C3003	ECA1CM100B	CAP,E 10UF-16V
C3004	ECA1HM010B	CAP,E 1UF-50V
C3006	ECA1HM010B	CAP,E 1UF-50V
C3007	ECA1CM100B	CAP,E 10UF-16V
C3008	ECA1CM100B	CAP,E 10UF-16V
C3009	ECA1HM010B	CAP,E 1UF-50V
C3010	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3011	ECA1HM010B	CAP,E 1UF-50V
C3012	ECA1CM100B	CAP,E 10UF-16V
C3013	ECA1CM100B	CAP,E 10UF-16V
C3014	ECA1HM010B	CAP,E 1UF-50V
C3016	ECA1HM010B	CAP,E 1UF-50V
C3018	ECA1CM100B	CAP,E 10UF-16V
C3019	ECA1CM100B	CAP,E 10UF-16V
C3020	ECA1HM010B	CAP,E 1UF-50V
C3021	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3022	ECA1HM010B	CAP,E 1UF-50V
C3023	ECA1CM100B	CAP,E 10UF-16V
C3024	ECA1CM100B	CAP,E 10UF-16V
C3025	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6501	ECA0JM101B	CAP,E 100UF-6.3V
C6502	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6503	TCJ2VF1H104Z	CAP,C .1UF-Z-50V

REF NO.	PART NO.	DESCRIPTION
C6504	ECA1AM470B	CAP,E 47UF-10V
C6505	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6506	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6507	ECA1HMR47B	CAP,E .47UF-50V
C6508	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6509	ECA1CM470B	CAP,E 47UF/16V
C6510	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C6511	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C6512	ECA1CM470B	CAP,E 47UF/16V
C6513	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6514	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6515	TCJ2VF1H104Z	CAP,C .1UF-Z-50V
C6516	ECA1CM470B	CAP,E 47UF/16V
C6517	TCJ2VC1H181J	CAP,C 180PF-J-50V
C6518	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6519	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6520	ECA1CM470B	CAP,E 47UF/16V
C6525	TCJ2VC1H120J	CAP,C 12PF-J-50V
C6526	TCJ2VC1H270J	CAP,C 27PF-J-50V
C6532	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6569	TCJ2VC1H180J	CAP,C 18PF-J-50V
C6570	ECA1HM010B	CAP,E 1UF-50V
C6572	ECEA1CN470UB	CAP,E 47UF-16V
	DIODES	
D001	MA165TA5VT	DIODE, SWITCHING
D002	MA165TA5VT	DIODE, SWITCHING
D003	MA4056MTA	DIODE
D006	MA4330HTA	DIODE
D010	MA4100LTA	DIODE
D014	MA165TA5VT	DIODE, SWITCHING
D015	MA700ATA	DIODE
D051	MA4056MTA	DIODE, ZENER
D240	MA165TA5VT	DIODE, SWITCHING
D354	MA165TA5VT	DIODE, SWITCHING
D355	MA165TA5VT	DIODE, SWITCHING
D356	MA165TA5VT	DIODE, SWITCHING
D360	ERA22-04V3	DIODE, SILICONE
D361	ERA22-04V3	DIODE, SILICONE
D362	ERA22-04V3	DIODE, SILICONE
D363	MA165TA5VT	DIODE, SWITCHING
D375	MA165TA5VT	DIODE, SWITCHING
D451	ERA15-02V3	DIODE
D455	MA165TA5VT	DIODE, SWITCHING
D456	MA165TA5VT	DIODE, SWITCHING
D457	MA165TA5VT	DIODE, SWITCHING
D459	MA165TA5VT	DIODE, SWITCHING
D551	ERD07-15E	DIODE
D552	RU3NLFA1	DIODE
D553	**MA4062LTVTA**	**DIODE, ZENER**
D554	**MA4270MTA**	**DIODE**
D556	MA4360HTA	DIODE, ZENER

REPLACEMENT PARTS LIST

Model: CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
D561	MA165TA5VT	DIODE, SWITCHING
D562	**D1NL40V70**	**DIODE**
D563	**TVSRU2NV1**	**DIODE, SILICONE**
D564	**TVSRU2NV1**	**DIODE, SILICONE**
D570	**D1NL40V70**	**DIODE**
D575	MA165TA5VT	DIODE, SWITCHING
D580	**D1NL40V70**	**DIODE**
D753	AU01ZV0	DIODE
D754	MA165TA5VT	DIODE, SWITCHING
D801	**GP15KL-042**	**DIODE**
D802	**GP15KL-042**	**DIODE**
D803	**GP15KL-042**	**DIODE**
D804	**GP15KL-042**	**DIODE**
D806	**TRPW5B0M050D**	**THERMISTOR**
D807	**D1NL20UV70**	**DIODE**
D808	**D1NL20UV70**	**DIODE**
D809	MA4036MTA	DIODE
D810	MA4150MTA	DIODE
D811	MA4270MTA	DIODE
D812	D1NL20UV70	DIODE
D813	TMPG10G3	DIODE
D814	TMPG10G3	DIODE
D822	**RU3YX-MV1**	**DIODE, RECTIFIER**
D823	**S3L60P154004**	**DIODE**
D824	**D1NL20UV70**	**DIODE**
D825	MA165TA5VT	DIODE, SWITCHING
D826	MA4180HTA	DIODE
D837	MA4068MTA	DIODE, ZENER
D838	MA4150MTA	DIODE
D839	MA165TA5VT	DIODE, SWITCHING
D840	**D1NL20UV70**	**DIODE**
D845	MA165TA5VT	DIODE, SWITCHING
D2302	MA165TA5VT	DIODE, SWITCHING
D2303	MA165TA5VT	DIODE, SWITCHING
D2318	MA165TA5VT	DIODE, SWITCHING
D3007	MA4110MTA	DIODE, ZENER
D3008	MA4110MTA	DIODE, ZENER
D3023	MA4110MTA	DIODE, ZENER
D3024	MA4110MTA	DIODE, ZENER
D3025	MA4110MTA	DIODE, ZENER
D3026	MA4110MTA	DIODE, ZENER
D3027	MA4110MTA	DIODE, ZENER
D3028	MA4110MTA	DIODE, ZENER
D3029	MA4110MTA	DIODE, ZENER
D3030	MA4110MTA	DIODE, ZENER
	FUSES	
F801	**XBA2A00101**	**FUSE 6.3A 125V**
	INTEGRATED CIRCUITS	
IC001	**MN101C46FTF1**	**MPU**
IC002	TVR2AJ100	EEPROM
IC003	PIC-37042SR	REMOTE SENSOR

REF NO.	PART NO.	DESCRIPTION
IC005	PQ1R33	STNDBY REG.
IC006	PST9128NR	RESET
IC101	**TA1310BN**	**VCJ**
IC351	TDA6103Q-N3	RGB OUT AMP.
IC451	LA78045	VERTICAL OUT
IC551	AN78M09LB	9V REG.
IC552	AN7805LB	5V REG.
IC750	NJM4565L	HORIZONTAL
IC801	**PC123FY2**	**OPTHO COUPLER**
IC802	**PC123FY2**	**OPTHO COUPLER**
IC820	**UPC1093J-T**	**ZENER REG.**
IC2201	AN5849S-E1V	MTS
IC2301	AN5277	AUDIO AMP.
IC2331	NJM4565L	VAO AMP.
IC2451	BH3868CFS-E2	SOUND PROCESSOR
IC3001	M52790SP	A/V SWITCH
IC6501	TC90A49P	3L COMB FILTER
	COILS	
J146	EXCELSA35T	FERRITE BEAD
J159	TLTABT470K	COIL, PEAKING 47UH
L002	ELESN180JA	COIL, PEAKING 18UH
L003	TLTABT2R2K	COIL, PEAKING 2.2UH
L004	TLTABT2R2K	COIL, PEAKING 2.2UH
L005	ELESN330JA	COIL, PEAKING 33UH
L006	EXCELSA35T	FERRITE BEAD
L008	TLTABT101K	COIL, PEAKING 100UH
L010	TLTABT2R2K	COIL, PEAKING 2.2UH
L011	TLTABT2R2K	COIL, PEAKING 2.2UH
L012	TLTABT2R2K	COIL, PEAKING 2.2UH
L013	TLTABT2R2K	COIL, PEAKING 2.2UH
L106	EXCELSA39V	FERRITE BEAD
L157	TLTABT101K	COIL, PEAKING 100UH
L301	TLTABT470K	COIL, PEAKING 47UH
L302	ELESN120JA	COIL, PEAKING 12UH
L319	TLTABT101K	COIL, PEAKING
L519	ELESN101JA	COIL, PEAKING 100UH
L551	**ELH5L6120**	**COIL**
L553	EXCELSA39V	FERRITE BEAD
L556	ELC18B801E	COIL
L559	TLUADNB682K	COIL
L601	TLUABTA560K	COIL, PEAKING 56UH
L706	EXCELSA35T	FERRITE BEAD
L751	ELC18B801E	COIL
L752	TALL13N103JB	COIL
L801	**ELF20N020A**	**COIL, 2UH**
L802	**G0C681Z00001**	**COIL**
L803	EXCELSA26T	FERRITE BEAD
L805	TALL08T220KA	TRANSFORMER, LINE FILTER
L807	EXCELSA39V	FERRITE BEAD
L808	**ELF20N020A**	**COIL, 2UH**
L809	EXCELSA39V	FERRITE BEAD

REPLACEMENT PARTS LIST

Model:CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
L951	EXCELSA24T	FERRITE BEAD
L953	EXCELSA24T	FERRITE BEAD
L954	EXCELSA24T	FERRITE BEAD
L955	EXCELSA24T	FERRITE BEAD
L6503	ELESN330JA	COIL, PEAKING 33UH
L6504	EXCELSA35V	FERRITE BEAD
L6505	EXCELSA35V	FERRITE BEAD
L6507	ELESN150JA	COIL, PEAKING 15UH
L6509	EXCELSA35V	FERRITE BEAD
	TRANSISTORS	
Q001	2SC1685QRSTA	TRANSISTOR
Q002	2SC1685QRSTA	TRANSISTOR
Q003	2SD601ARTX	TRANSISTOR
Q004	2SC1685QRSTA	TRANSISTOR
Q005	2SD601ARTX	TRANSISTOR
Q007	2SC1685QRSTA	TRANSISTOR
Q201	2SD601ARTX	TRANSISTOR
Q303	2SD601ARTX	TRANSISTOR
Q369	2SA1309ATA	TRANSISTOR
Q402	2SD601ARTX	TRANSISTOR
Q453	2SD601ARTX	TRANSISTOR
Q480	2SA1309ATA	TRANSISTOR
Q501	2SC3941HTA	TRANSISTOR
Q515	2SD601ARTX	TRANSISTOR
Q551	**2SC5339LBMA1**	**TRANSISTOR**
Q603	2SD601ARTX	TRANSISTOR
Q611	2SB709ARTX	TRANSISTOR
Q701	2SD601ARTX	TRANSISTOR
Q751	2SK2146LB	TRANSISTOR
Q754	2SD601ARTX	TRANSISTOR
Q801	**B1DEGQ000013**	**TRANSISTOR**
Q803	2SC1318STA	TRANSISTOR
Q804	2SC1318STA	TRANSISTOR
Q805	2SC1318STA	TRANSISTOR
Q821	2SC3311ASTA	TRANSISTOR
Q822	2SC3311ASTA	TRANSISTOR
Q861	2SB1011QRL	TRANSISTOR
Q862	2SC1473ATA	TRANSISTOR
Q901	2SD601ARTX	TRANSISTOR
Q951	2SC3311ATA	TRANSISTOR
Q952	2SC3311ATA	TRANSISTOR
Q953	2SC1741ASTP	TRANSISTOR
Q954	2SB1030ATA	TRANSISTOR
Q955	2SB1569AF51E	TRANSISTOR
Q956	2SD2400AF51E	TRANSISTOR
Q957	2SA1309ATA	TRANSISTOR
Q958	2SC3311ATA	TRANSISTOR
Q961	2SC3311ATA	TRANSISTOR
Q962	2SC3311ATA	TRANSISTOR
Q2301	2SD601ARTX	TRANSISTOR
Q2302	2SD601ARTX	TRANSISTOR
Q2303	2SD601ARTX	TRANSISTOR
Q2331	2SD601ARTX	TRANSISTOR
Q2332	2SB709ARTX	TRANSISTOR
Q2333	2SD601ARTX	TRANSISTOR
Q2334	2SD601ARTX	TRANSISTOR
Q2335	2SB709ARTX	TRANSISTOR
Q2336	2SD601ARTX	TRANSISTOR
Q6501	2SD601ARTX	TRANSISTOR
Q6502	2SB709ARTX	TRANSISTOR
Q6506	2SD601ARTX	TRANSISTOR
Q6510	2SD601ARTX	TRANSISTOR
Q6511	2SD601ARTX	TRANSISTOR
Q6512	2SD601ARTX	TRANSISTOR
Q6519	2SD601ARTX	TRANSISTOR
	RELAYS	
RL801	**TSEH0005**	**RELAY**
RL802	**TSEH0005**	**RELAY**
	RESISTORS	
R001	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R002	ERJ6GEYJ182V	RES,M 1.8K-J-1/10W
R004	ERDS1TJ122T	RES,C 1.2K-J-1/2W
R005	ERDS2TJ470T	RES,C 47-J-1/4W
R006	ERJ6ENF1372V	RES,M 13.7K-F-1/10W
R007	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R009	ERJ6GEYJ221V	RES,M 220-J-1/10W
R010	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R011	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R012	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R013	ERJ6ENF1002V	RES,M 10K-F-1/10W
R014	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R015	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R016	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R017	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R020	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R021	ERJ6GEYJ101V	RES,M 100-J-1/10W
R022	ERJ6GEYJ101V	RES,M 100-J-1/10W
R023	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R024	ERJ6ENF2322V	RES,M 23.2K-F-1/10W
R025	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R027	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R030	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R032	ERJ6ENF1002V	RES,M 10K-F-1/10W
R033	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R034	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R035	ERJ6GEYJ362V	RES,M 3.6K-J-1/10W
R036	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R037	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R038	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R039	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R040	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R041	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W

REPLACEMENT PARTS LIST

Model: CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R042	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R044	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R045	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R046	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R047	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R048	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R049	ERJ6GEYJ101V	RES,M 100-J-1/10W
R057	ERDS2TJ472T	RES,C 4.7K-J-1/4
R060	ERJ6GEYJ471V	RES,M 470-J-1/10W
R061	ERJ6GEYJ471V	RES,M 470-J-1/10W
R062	ERDS2TJ101T	RES,C 100-J-1/4W
R066	ERJ6GEYJ752V	RES,M 7.5K-J-1/10W
R067	ERJ6GEYJ752V	RES,M 7.5K-J-1/10W
R068	ERJ6GEYJ752V	RES,M 7.5K-J-1/10W
R072	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R073	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R074	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R075	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R076	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R077	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R078	ERJ6GEYJ101V	RES,M 100-J-1/10W
R079	ERJ6GEYJ101V	RES,M 100-J-1/10W
R122	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R123	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R201	ERJ6GEYJ331V	RES,M 330-J-1/10W
R223	ERJ6GEYJ561V	RES,M 560-J-1/10W
R225	ERJ6GEYJ331V	RES,M 330-J-1/10W
R226	ERJ6GEYJ331V	RES,M 330-J-1/10W
R245	ERJ6GEYJ224V	RES,M 220K-J-1/10W
R246	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R301	ERJ6GEYJ101V	RES,M 100-J-1/10W
R302	ERJ6GEYJ101V	RES,M 100-J-1/10W
R303	ERJ6GEYJ101V	RES,M 100-J-1/10W
R306	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R310	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R328	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R329	ERJ6GEYJ304V	RES,M 300K-J-1/10W
R341	ERJ6GEYJ474V	RES,M 470K-J-1/10W
R351	ER0S2TKF9100	RES,M 910-F-1/4W
R352	ER0S2TKF9100	RES,M 910-F-1/4W
R353	ER0S2TKF9100	RES,M 910-F-1/4W
R354	ERDS2TJ621T	RES,C 620-J-1/4W
R355	ERDS2TJ621T	RES,C 620-J-1/4W
R356	ERDS2TJ621T	RES,C 620-J-1/4W
R357	ERDS2TJ102T	RES,C 1K-J-1/4W
R358	ERDS1TJ124T	RES,C 120K-J-1/2W
R359	ERDS1TJ124T	RES,C 120K-J-1/2W
R360	ERDS1TJ124T	RES,C 120K-J-1/2W
R361	ER0S2TKF8451	RES,M 7.68K-F-1/4W
R362	ER0S2TKF2201	RES,M 2.2K-F-1/4W
R363	ERC12GK102D	RES,C 1K-K-1/2W
R364	ERC12GK102D	RES,C 1K-K-1/2W
R365	ERC12GK102D	RES,C 1K-K-1/2W
R369	ERDS2TJ393T	RES,C 39K-J-1/4W
R371	ERDS2TJ102T	RES,C 1K-J-1/4W
R372	ERDS2TJ102T	RES,C 1K-J-1/4W
R374	ERQ12AJ121P	RES,F 120-J-1/2W
R375	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R401	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R402	ERJ6GEYJ471V	RES,M 470-J-1/10W
R403	ERJ6GEYJ622V	RES,M 6.2K-J-1/10W
R404	ERJ6GEYJ101V	RES,M 100-J-1/10W
R405	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R410	ERJ6ENF2492V	RES,M 24.9K-F-1/10W
R412	ERJ6ENF1003V	RES,M 100K-F-1/10W
R450	ERJ6GEYJ821V	RES,M 820-J-1/10W
R451	ERG2FJ221H	RES,M 220-J-2W
R452	ERDS1FJ6R8T	RES,C 6.8-J-1/2W
R453	ER0S2TKF1202	RES,M 12K-F-1/4W
R454	ERDS2TJ102T	RES,C 1K-J-1/4W
R455	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R456	ERDS2TJ821T	RES,C 820-J-1/4W
R457	ERDS2TJ361T	RES,C 360-J-1/4W
R458	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R459	ERX1SJ1R5P	RES,M 1.5-J-1W
R460	ER0S2TKF1002	RES,M 10K-F-1/4
R461	ER0S2TKF1501	RES,M 1.5K-F-1/4W
R465	ERJ6GEYJ104V	RES,M 100K-J-1/10W
R468	ERJ6GEYJ104V	RES,M 100K-J-1/10W
R469	ERJ6GEYJ101V	RES,M 100-J-1/10W
R470	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R471	ERJ6GEYJ224V	RES,M 220K-J-1/10W
R472	ERJ6GEYJ123V	RES,M 12K-J-1/10W
R476	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R480	ERDS2TJ392T	RES,C 3.9K-J-1/4W
R481	ERDS1FJ1R0T	RES,C 1.0-J-1/2W
R482	ERDS1FJ1R0T	RES,C 1.0-J-1/2W
R485	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W
R486	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R487	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R489	ER0S2TKF1202	RES,M 12K-F-1/4W
R490	ER0S2TKF5101	RES,M 5.1K-F-1/4W
R491	ER0S2TKF1052	RES,M 10.5K-F-1/4W
R504	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R505	ERDS1TJ561T	RES,C 560-J-1/2W
R510	ERG2FJ332H	RES,M 3.30K-J-2W
R512	ERG3FJ152H	RES,M 1500-J-3W
R513	ERG3FJ152H	RES,M 1500-J-3W
R515	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R516	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R517	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R524	ERG1FJS122D	RES,M 1200-J-1W

REPLACEMENT PARTS LIST

Model:CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R542	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R547	**ERQ1CKPR56S**	**RES,F .56-K-1W**
R550	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R553	ERG3FJ470H	RES,M 47-J-3W
R556	**ERDS1FJ1R0T**	**RES,C 1.0-J-1/2W**
R557	ERF10ZK2R7	RES,W 2.7-K-10W
R559	ERG2FJ683H	RES,M 12K-J-2W
R560	**ERDS1FJ1R0T**	**RES,C 1.0-J-1/2W**
R561	ERDS2TJ103T	RES,C 10K-J-1/4W
R562	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R565	**ERDS1FJ1R0T**	**RES,C 1.0-J-1/2W**
R567	**ERDS1FJ1R0T**	**RES,C 1.0-J-1/2W**
R571	**ERDS1FJ1R0T**	**RES,C 1.0-J-1/2W**
R576	ERQ12AJ101P	RES,F 100-J-1/2W
R580	**ERD25FJ4R7P**	**RES,C 4.7-J-1/4W**
R581	**ERJ6ENF1692V**	**RES,M 16.9K-F-1/10W**
R582	**ERJ6ENF4992V**	**RES,M 49.9K-F-1/10W**
R590	ERDS2TJ563T	RES,C 56K-J-1/4W
R597	ER0S2TKF2202	RES,M 22K-F-1/4W
R601	ERJ6GEYJ391V	RES,M 390-J-1/10W
R606	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R613	ERJ6GEYJ471V	RES,M 470-J-1/10W
R614	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R618	ERJ6GEYJ474V	RES,M 470K-J-1/10W
R619	ERJ6GEYJ563V	RES,M 56K-J-1/10W
R620	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R701	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R702	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R704	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R705	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R706	ERJ6GEYJ161V	RES,M 160-J-1/10W
R707	ERJ6GEYJ561V	RES,M 560-J-1/10W
R708	ERJ6GEYJ101V	RES,M 100-J-1/10W
R709	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R710	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R711	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R712	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R713	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R714	ERDS1FJ102T	RES,C 1K-J-1/2W
R716	ERJ6GEYJ101V	RES,M 100-J-1/10W
R717	ERJ6GEYJ101V	RES,M 100-J-1/10W
R719	ERJ6GEYJ225V	RES,M 2.2M-J-1/10W
R720	ERJ6GEYJ274V	RES,M 270K-J-1/10W
R752	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R753	ERDS1FJ102T	RES,C 1K-J-1/2W
R754	ERDS1TJ751T	RES,C 750-J-1/2W
R756	ERG2FJ820H	RES,M 82-J-2W
R757	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R801	**ERF7ZK1R5**	**RES,W 1.5-K-7W**
R804	ERDS2TJ182T	RES,C 1.8K-J-1/4W
R805	**ERG2FJ331H**	**RES,M 330-J-2W**

REF NO.	PART NO.	DESCRIPTION
R806	ERDS2TJ473T	RES,C 47K-J-1/4W
R807	ERD50FJ474P	RES,C 470K-J-1/2W
R808	ERD50FJ474P	RES,C 470K-J-1/2W
R809	ERDS2TJ561T	RES,C 560-J-1/4W
R811	ER0S2TKF2611	RES,M 2.6K-F-1/4W
R812	ERDS2TJ331T	RES,C 330-J-1/4W
R813	ERDS2TJ223T	RES,C 22K-J-1/4W
R815	**ERC12ZGM825D**	**RES,S 8.2MEG-M-1/2**
R820	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R821	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R822	ERDS1FJ102T	RES,C 1K-J-1/2W
R823	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R826	ERDS2TJ104T	RES,C 100K-J-1/4W
R827	ERDS2TJ183T	RES,C 18K-J-1/4W
R828	ERDS2TJ104T	RES,C 100K-J-1/4W
R829	ERX12SJR47P	RES,M .47-J-1/2W
R830	**ERDS2TJ103T**	**RES,C 10K-J-1/4W**
R832	ERDS2TJ104T	RES,C 100K-J-1/4W
R833	ERDS2TJ474T	RES,C 470K-J-1/4W
R836	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R837	ERDS2TJ102T	RES,C 1K-J-1/4W
R838	ER0S2TKF2201	RES,M 2.2K-F-1/4W
R839	ER0S2TKF1003	RES,M 100K-F-1/4
R843	ERDS2TJ271T	RES,C 270-J-1/4W
R844	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R845	ERDS2TJ334T	RES,C 330K-J-1/4W
R849	ER0S2TKF2002	RES,M 20K-F-1/4W
R850	**ERQ12HJR56P**	**RES,F .56-J-1/2W**
R851	ERX12SJR47P	RES,M .47-J-1/2W
R853	ERX12SZJR12P	RES,M .12-J-1/2W
R854	ERX12SJR22P	RES,M .22-J-1/2W
R855	ERDS2TJ473T	RES,C 47K-J-1/4W
R856	ERQ3CJ3R9	RES,F 3.9-J-3W
R857	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R858	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R861	ERDS2TJ103T	RES,C 10K-J-1/4W
R862	ERDS2TJ104T	RES,C 100K-J-1/4W
R863	ERJ6GEYJ393V	RES,M 39K-J-1/10W
R864	ERDS2TJ104T	RES,C 100K-J-1/4W
R901	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R902	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R903	ERJ6GEYJ561V	RES,M 560-J-1/10W
R904	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W
R905	ERJ6GEYJ391V	RES,M 390-J-1/10W
R951	ERDS2TJ821T	RES,C 820-J-1/4W
R952	ERDS2TJ153T	RES,C 15K-J-1/4W
R953	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R954	ERDS2TJ431T	RES,C 430-J-1/4W
R956	ERDS2TJ121T	RES,C 120-J-1/4W
R958	ERDS2TJ391T	RES,C 390-J-1/4W
R959	ERDS2TJ101T	RES,C 100-J-1/4W

REPLACEMENT PARTS LIST

Model: CT-24SX11E, CT-24SX11UE, CT-24SX11CE

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R960	ERQ14AJ100E	RES,F 10-J-1/4W
R961	ERQ1CJP331S	RES,F 330-J-1W
R962	ERDS2TJ330T	RES,C 33-J-1/4W
R963	ERDS2TJ330T	RES,C 33-J-1/4W
R964	ERDS2TJ471T	RES,C 470-J-1/4W
R965	ERDS2TJ563T	RES,C 56K-J-1/4W
R966	ERDS1FVJ471T	RES,C 470-J-1/4W
R967	ERDS2TJ563T	RES,C 56K-J-1/4W
R968	ERDS2TJ471T	RES,C 470-J-1/4W
R969	ERDS2TJ390T	RES,C 39-J-1/2W
R970	ERDS2TJ2R2T	RES,C 2.2-J-1/4W
R971	ERDS2TJ2R2T	RES,C 2.2-J-1/4W
R972	ERDS2TJ390T	RES,C 39-J-1/2W
R973	ERDS2TJ101T	RES,C 100-J-1/4W
R974	ERDS2TJ333T	RES,C 33K-J-1/4W
R975	ERDS2TJ101T	RES,C 100-J-1/4W
R976	ERDS2TJ101T	RES,C 100-J-1/4W
R977	ERDS2TJ561T	RES,C 560-J-1/4W
R978	ERDS2TJ101T	RES,C 100-J-1/4W
R987	ERDS2TJ472T	RES,C 4.7K-J-1/4
R988	ERDS2TJ331T	RES,C 330-J-1/4W
R989	ERDS2TJ682T	RES,C 6.8K-J-1/4W
R990	ERDS2TJ471T	RES,C 470-J-1/4W
R993	ERDS2TJ471T	RES,C 470-J-1/4W
R2203	ERJ6GEYJ751V	RES,M 750-J-1/10W
R2206	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2207	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2221	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R2303	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R2304	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R2307	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R2309	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R2310	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R2311	ERJ6GEYJ271V	RES,M 270-J-1/10W
R2312	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R2313	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R2316	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2317	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2318	ERDS1TJ332T	RES,C 3.3K-J-1/2W
R2319	ERDS1TJ332T	RES,C 3.3K-J-1/2W
R2321	ERDS2TJ181T	RES,C 180-J-1/4W
R2322	ERDS2TJ181T	RES,C 180-J-1/4W
R2323	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R2324	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2325	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2326	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2332	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2333	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2334	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2335	ERJ6GEYJ183V	RES,M 18K-J-1/10W
R2336	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W

REF NO.	PART NO.	DESCRIPTION
R2337	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R2338	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R2339	ERJ6GEYJ183V	RES,M 18K-J-1/10W
R2340	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R2345	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2346	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2347	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2349	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R2351	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2352	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R2353	ERJ6GEYJ563V	RES,M 56K-J-1/10W
R2354	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2356	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2366	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R2367	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R2431	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2432	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2433	ERJ6ENF4701V	RES,M 4.7K-F-1/10W
R2434	ERJ6GEYJ681V	RES,M 680-J-1/10W
R2435	ERJ6ENF3902V	RES,M 39K-F-1/10W
R2436	ERJ6ENF6202V	RES,M 62K-F-1/10W
R2437	ERJ6GEYJ681V	RES,M 680-J-1/10W
R2438	ERJ6GEYJ271V	RES,M 270-J-1/10W
R2439	ERJ6GEYJ271V	RES,M 270-J-1/10W
R3001	ERJ6GEYJ101V	RES,M 100-J-1/10W
R3003	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3004	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3007	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3008	ERJ6GEYJ750V	RES,M 75-J-1/10W
R3009	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3010	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3011	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3012	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3013	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3014	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3015	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3016	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3017	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3018	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3019	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3020	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3024	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3025	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3030	ER0S2TKF75R0	RES,M 75-F-1/4W
R6501	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R6502	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R6503	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6504	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6505	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6506	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6509	ERJ6GEYJ471V	RES,M 470-J-1/10W

REPLACEMENT PARTS LIST

Model:CT-24SX11E, CT-24SX11UE, CT-24SX11CE

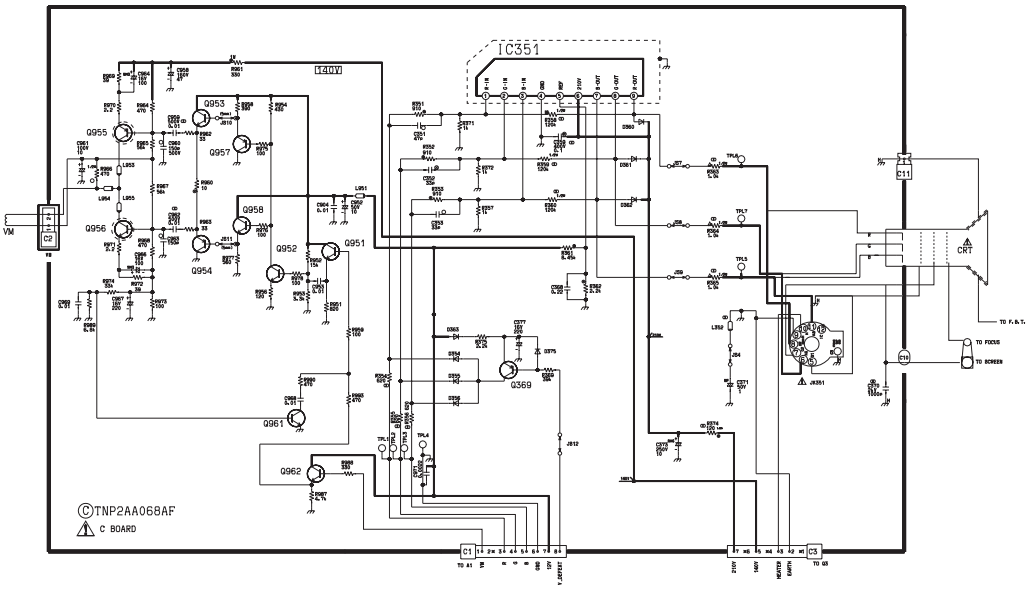
Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

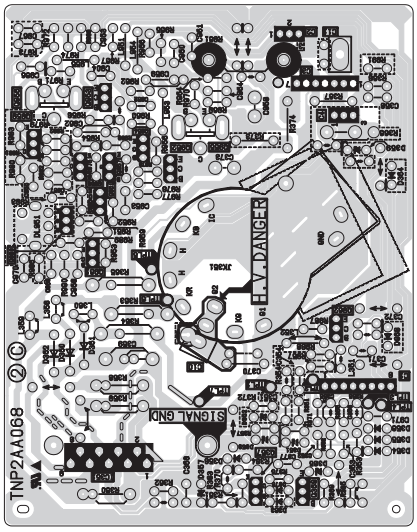
REF NO.	PART NO.	DESCRIPTION
R6510	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6512	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6513	ERJ6GEYJ122V	RES,M 1.2K-J-1/10W
R6514	ERJ6GEYJ123V	RES,M 12K-J-1/10W
R6516	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R6517	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6520	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6522	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6524	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6538	ERJ6GEYJ821V	RES,M 820-J-1/10W
R6548	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6565	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6566	ERJ6GEYJ681V	RES,M 680-J-1/10W
R6567	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6568	ERJ6GEYJ102V	RES,M 1K-J-1/10W
SWITCHES		
S001	EVQPC105K	SWITCH
S002	EVQPC105K	SWITCH
S003	EVQPC105K	SWITCH
S004	EVQPC105K	SWITCH
S005	EVQPC105K	SWITCH
S006	EVQPC105K	SWITCH
S007	EVQPC105K	SWITCH
TRANSFORMERS		
T501	ETH19Y70AY	TRANSFORMER, HORIZONTAL DRIVER
T551	**KFT4AA390F**	**TRANSFORMER, FLYBACK**
T801	**ETS39AG375NC**	**TRANSFORMER**
CRISTALS/FILTERS		
X001	TSSA092	CRYSTAL OSCILLATOR
X501	TSS2AA001	CRYSTAL, 3.58MHZ
X601	TAFCSB503F30	CRYSTAL
OTHERS		
TNR001	**ENG36604G**	**TUNER**
M001	**TSX2AA0111-1**	**A/C LINE CORD**
M002	**A60LUQ085X**	**CRT 25"**
M003	TJSC01200	CRT SOCKET

REF NO.	PART NO.	DESCRIPTION
DY	**KDY4QHA31F**	**YOKE, DEFLECTION**
DEG	**TSP2AA014**	**COIL, DEGAUSSING 27"**
M004	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP
M005	TXF3A011DD	ASSY., DAG GND
M006	TAS2AA0023	SPEAKER 8-OHM
M007	TBM2A30843	BADGE, PANASONIC
M008	TBX2AA0151G	BUTTON, 7-KEY
M009	TEK6940	DOOR CATCH
M010	TKP2AA0613S	CONTROL DOOR
M011	TKX2AA0131	IR GUIDE
M012	TMW2A97121	STRAIN RELIEF: AC LINE CORD
M013	TXFEA0041DBS	SPEAKER BRACKETS
M014	TXFKY40ESER	ASSY, CABINET FRONT *(2)Rubber sheet,(1)Badge panasonic (1) IR Guide,(1)Cabinet, (1)Felt,Rl 8mm x 46M*
M015	TXFKU30ESER	ASSY, CABINET BACK *(2)Rubber sheet, (1)Overlay modelnameplate, (1)Name platemodel, (1)cover,cabinetback,(1)felt , (1)Instr.Sheet labels, (1)Label,X-RAY warning frn. (2)Label,XRAYWarning (1)Label,BBE patent*
JK3001	TJB2AA0221	TERMINAL, A/V 8P
JK3002	TJB2AA0171	TERMINAL, S-VHS
JK3003	TJB2AA0371	TERMINAL, FRONT A/V
JK3005	TJB2AA0211-1	TERMINAL, A/V 2P
ACCSESORIES		
M016	EUR511502	REMOTE CONTROL
M017	UR51EC975A	BATTERY COVER, REMOTE CON
M018	TQB2AA7058	REMOTE GUIDE
M019	TQB2AA0377	MANUAL, OWNERS *CT-24SX11E/UE*
M020	TQB2AA0409	MANUAL, OWNERS *CT-24SX11CE*
M021	TQB2AA7078-1	V-CHIP NA8

C- Board Schematic, Layout & Voltages - Diagrama Eléctrico, Diagrama Impreso y Voltajes Tarjeta-C

ALL MODELS





Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ▼ Test point but no pin ⌇
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

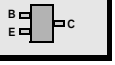
C-Board Voltages - Voltajes Placa-C

IC351	
1	1.75
2	1.75
3	1.76
4	0.00
5	1.85
6	218.39
7	141.10
8	142.90
9	144.90

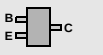
	Q369	Q951	Q952	Q953	Q954	Q955
B	6.90	2.48	1.13	7.84	6.51	141.90
C	2.11	8.93	7.20	8.93	0.00	73.70
E	8.39	1.85	0.49	7.20	7.15	142.40

	Q956	Q957	Q958	Q961	Q962
B	1.00	7.20	7.19	0.00	3.10
C	73.80	0.00	8.93	0.00	8.94
E	0.00	7.84	6.51	0.00	2.49

CHIP TRANSISTOR LEAD DESIGNATION



IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



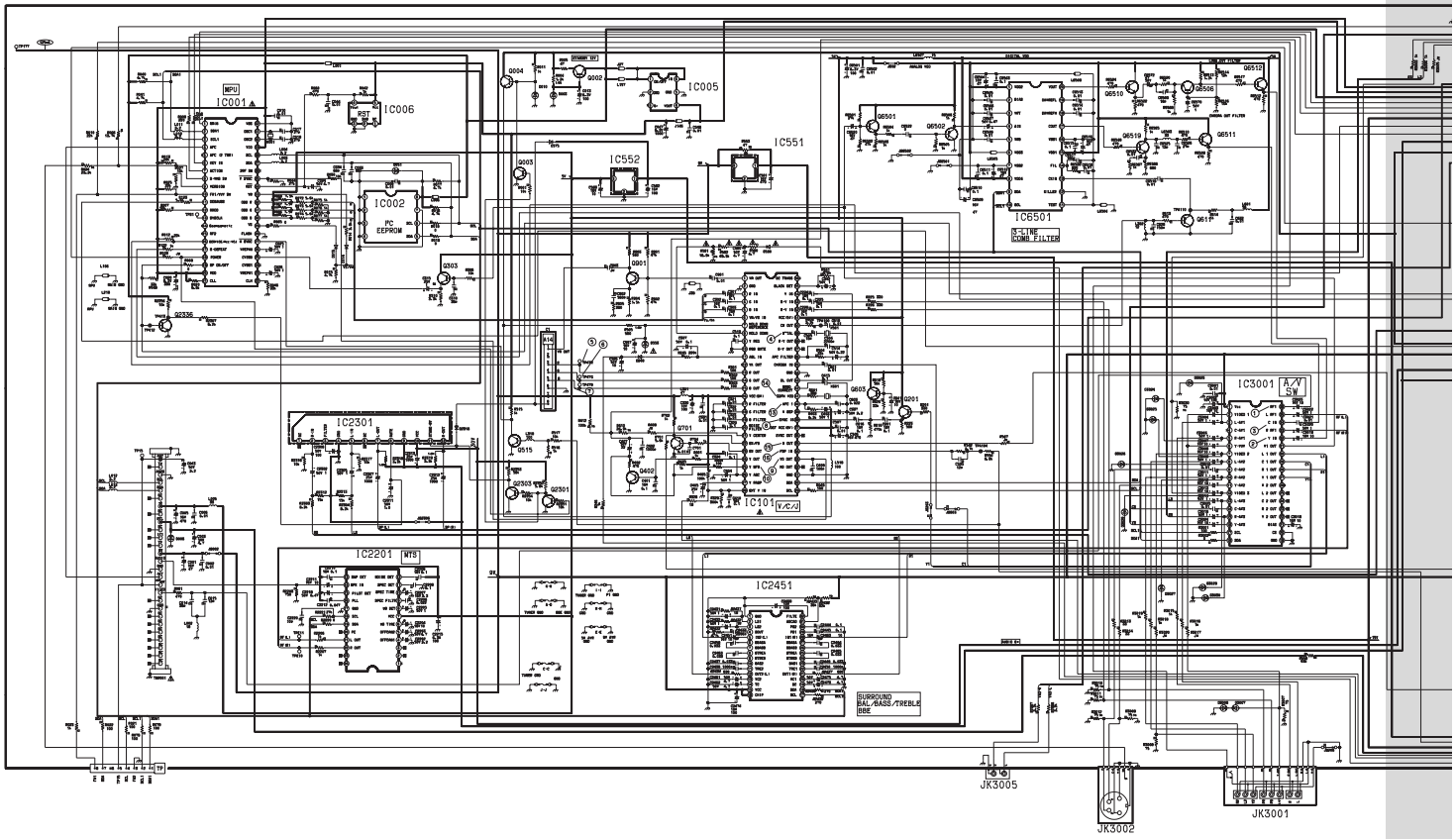
Notas de los Diagramas

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ▼ Los puntos de prueba fuera de los componentes se indican con ⌇
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

NOTA: Los demas símbolos de componentes incluidos son usados con fines de diseño.

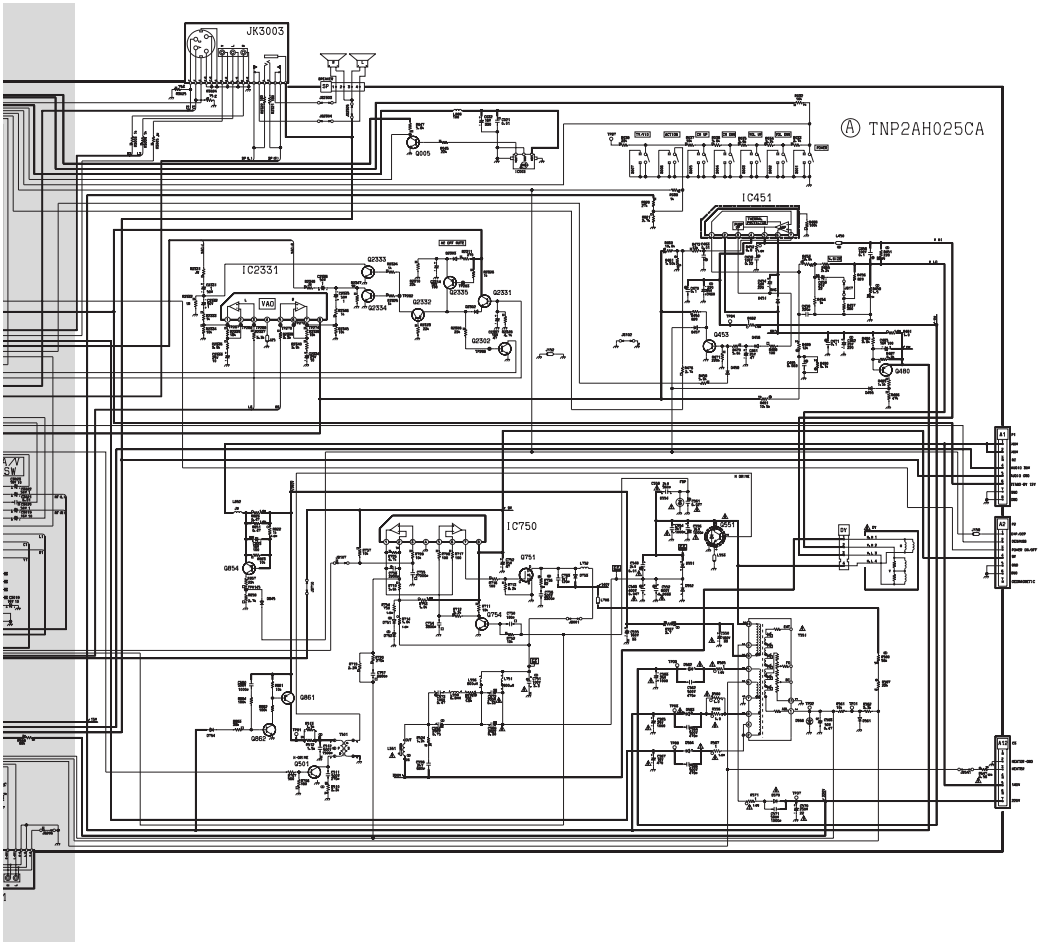
ALL MODELS

A-Board Schematic, Left Portion - Diagrama Eléctrico de la Tarjeta-A, Sección Izquierda



A-Board Schematic, Right Portion - Diagrama Eléctrico de la Tarjeta-A, Sección Derecha

ALL MODELS



IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

Medición de Voltajes

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

Voltage Measurements

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.

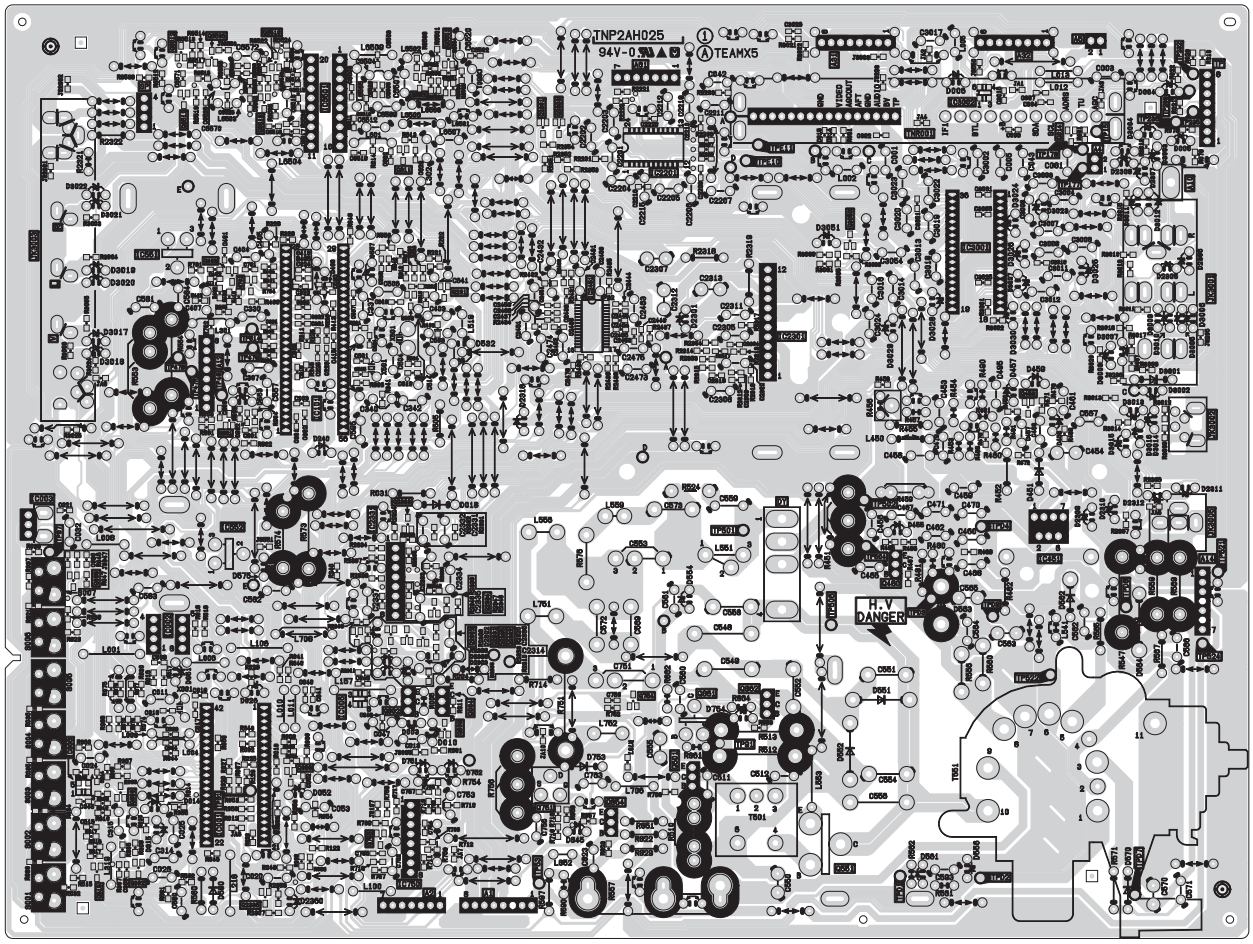
CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

ALL MODELS

A-Board Layout - Diagrama Impreso de la Tarjeta-A



IC001

1	0.00	22	2.07
2	4.75	23	2.41
3	4.80	24	1.61
4	1.73	25	1.55
5	0.77	26	2.40
6	3.26	27	2.76
7	1.71	28	0.00
8	3.26	29	0.00
9	0.00	30	0.00
10	1.64	31	0.00
11	0.00	32	0.00
12	3.26	33	0.00
13	1.64	34	3.28
14	0.00	35	3.50
15	0.00	36	3.24
16	0.00	37	3.91
17	0.00	38	3.83
18	3.14	39	3.28
19	0.62	40	1.57
20	3.28	41	1.54
21	1.51	42	0.00

IC002

1	0.00
2	0.00
3	0.00
4	0.00
5	5.00
6	0.00
7	3.84
8	3.88

IC003

1	2.77
2	0.00
3	4.99

IC005

1	4.99
2	0.00
3	1.29
4	3.28
5	0.00
6	4.98

IC006

1	0.00
2	0.00
3	0.00
4	3.28
5	3.28

IC101

1	4.11	29	3.86
2	0.00	30	3.81
3	3.36	31	0.00
4	3.35	32	0.00
5	3.34	33	4.85
6	0.00	34	1.19
7	6.03	35	1.87
8	5.05	36	0.00
9	5.16	37	9.15
10	0.00	38	3.14
11	5.63	39	6.34
12	4.51	40	7.68
13	2.76	41	6.00
14	2.81	42	4.92
15	2.88	43	1.11
16	8.71	44	0.00
17	5.26	45	1.76
18	5.25	46	1.42
19	2.24	47	2.25
20	2.69	48	2.27
21	2.96	49	3.90
22	3.03	50	3.37
23	0.68	51	4.93
24	0.66	52	2.97
25	5.15	53	3.39
26	2.05	54	3.77
27	4.30	55	3.10
28	4.98	56	3.21

IC2301

1	0.00	7	14.85
2	0.00	8	0.67
3	29.59	9	0.00
4	0.00	10	30.84
5	0.00	11	11.83
6	0.00	12	14.87

IC2201

1	0.00
2	0.00
3	0.00
4	2.22
5	2.18
6	0.34
7	4.92
8	2.24
9	2.42
10	0.43
11	2.24
12	3.09
13	3.30
14	2.75
15	3.33
16	3.43
17	0.00
18	3.62
19	3.83
20	0.00
21	2.20
22	2.19
23	0.00
24	0.00

IC2331

1	4.46
2	4.46
3	4.46
4	0.00
5	4.46
6	4.46
7	4.46
8	8.93

IC750

1	2.33
2	3.58
3	3.57
4	0.00
5	4.55
6	2.33
7	7.37
8	8.93

IC3001

1	8.91	19	0.00
2	3.59	20	0.00
3	4.58	21	4.08
4	4.59	22	3.26
5	4.58	23	3.91
6	3.57	24	3.93
7	3.60	25	3.92
8	4.58	26	3.32
9	4.59	27	3.26
10	4.58	28	3.91
11	3.60	29	3.93
12	4.58	30	3.92
13	4.59	31	3.77
14	4.58	32	3.94
15	4.58	33	4.58
16	3.59	34	4.59
17	4.83	35	4.58
18	4.76	36	3.99

IC451

1	1.33
2	16.52
3	-13.99
4	-15.77
5	0.25
6	16.52
7	1.32

IC552

1	8.89
2	0.00
3	4.94

IC551

1	16.81
2	0.00
3	8.94

IC6501

1	4.92
2	1.36
3	3.12
4	2.39
5	1.82
6	4.92
7	0.00
8	4.91
9	4.75
10	4.83
11	0.00
12	0.00
13	2.48
14	1.97
15	4.97
16	0.00
17	2.46
18	3.11
19	1.82
20	2.33

	Q002	Q003	Q004	Q005	Q201
B	5.67	0.00	9.89	0.64	3.25
C	8.81	9.81	14.50	0.00	4.92
E	5.00	0.00	9.23	0.00	2.58

	Q2301	Q2302	Q2303	Q2331	Q2332
B	0.69	0.00	0.00	0.00	0.00
C	0.00	0.13	11.83	14.15	0.00
E	0.00	0.00	0.00	0.00	0.00

	Q2333	Q2334	Q2335	Q2336	Q303
B	0.00	0.00	14.5	0.62	3.73
C	0.00	0.00	0.00	0.00	4.94
E	0.00	0.00	13.42	0.00	3.10

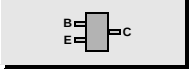
	Q402	Q453	Q480	Q501	Q515
B	0.68	0.72	16.63	0.30	0.00
C	3.49	0.00	0.00	106.50	2.76
E	0.00	0.00	16.86	0.00	0.00

	Q551	Q603	Q611	Q6501	Q6502
B	0.00	1.06	0.00	2.92	1.13
C	13.3	4.92	0.00	4.92	0.00
E	0.00	0.99	0.69	2.26	1.81

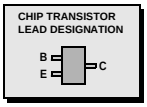
	Q6506	Q6510	Q6511	Q6512	Q6519
B	0.00	2.33	2.30	1.70	2.50
C	1.69	4.92	4.89	4.90	2.33
E	0.00	1.69	1.70	1.00	1.80

	Q701	Q751	Q754	Q854	Q901
B	0.65	7.28	0.00	142.90	3.45
C	3.04	11.81	4.49	0.00	3.10
E	0.00	0.00	0.00	143.40	2.77

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



CHIP TRANSISTOR LEAD DESIGNATION



Nota:

La medición de los voltajes se hizo con un Voltímetro Digital.

Note:

Obtained voltages with a digital multimeter.

Medición de Formas de Onda

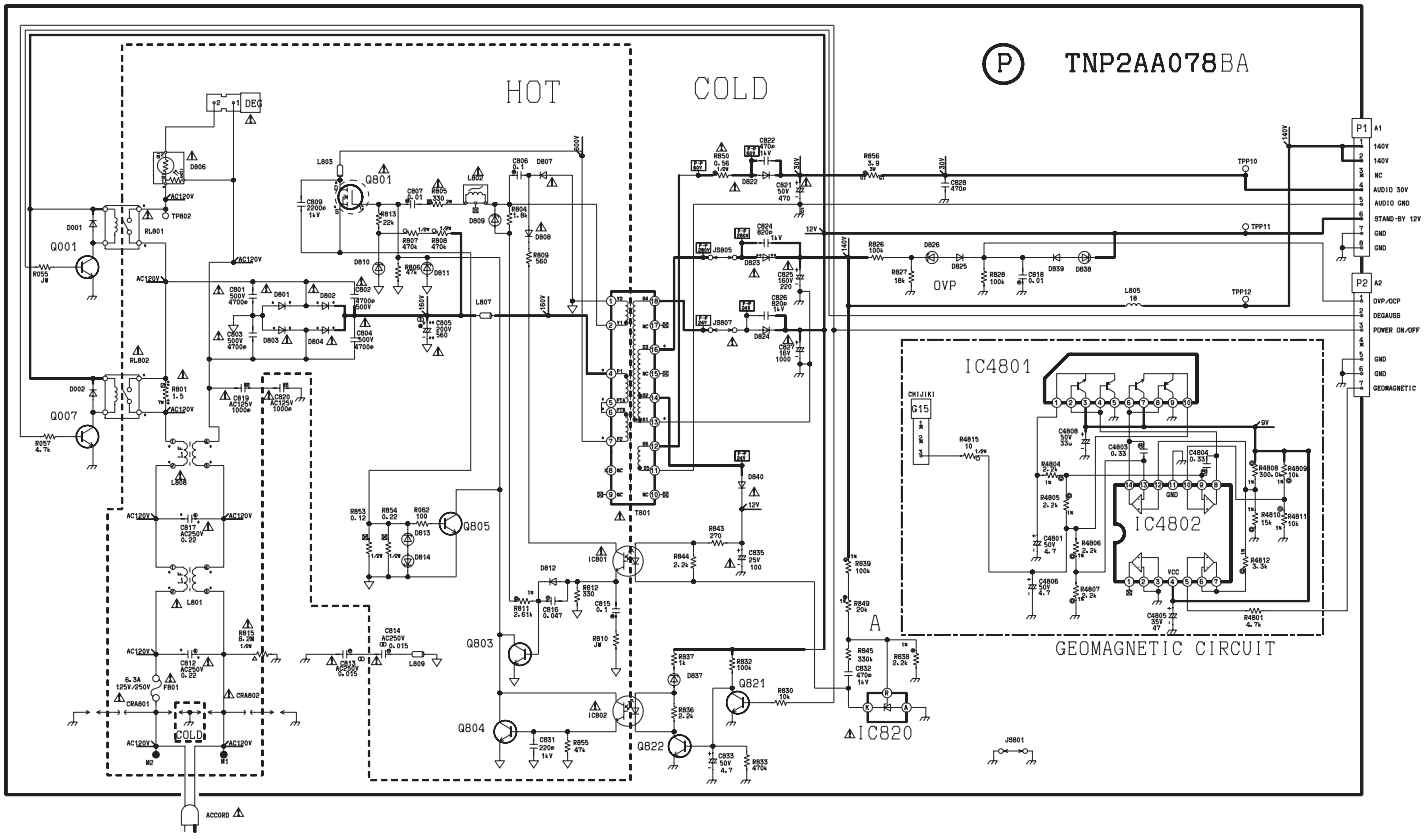
1. Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

Medición de Voltajes

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.


TNP2AA078BA
HOT
COLD
IC4801
IC4802
GEOMAGNETIC CIRCUIT
OVP
IC820
Q001
Q007
Q801
Q805
Q803
Q804
Q821
Q822
P1
P2
140V
NC
AUDIO 30V
AUDIO GND
STAND-BY 12V
GND
OVP/OCP
DEGAUSS
POWER ON/OFF
GEOMAGNETIC

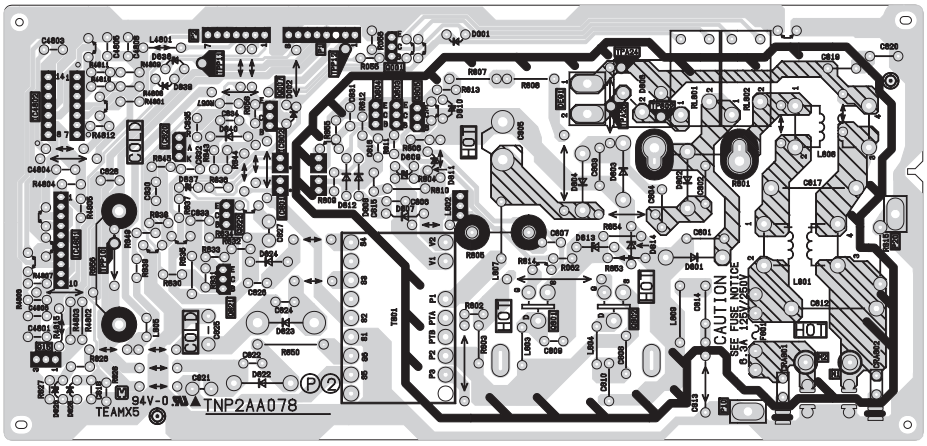
IC801
1 .... 14.09
2 .... 15.76
3 ..... 0.16
4 .... 13.02

IC802
1 .....11.00
2 ..... 3.45
3 ..... 0.00
4 .....11.00

IC820
1 .... 13.02
2 ..... 0.00
3 ..... 2.44

	Q001	Q007	Q801	Q803
B	0.00	0.69	0.10	0.00
C	0.00	0.36	-30.50	3.40
E	0.00	0.00	3.43	0.00

	Q821	Q822	Q804	Q805
B	0.56	0.00	0.00	0.00
C	0.00	11.00	3.45	3.43
E	0.00	0.00	0.00	0.00



Nota:

La medición de los voltajes se hizo con un Voltímetro Digital.

Note:

Obtained voltages with a digital multimeter.

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*

CHIP TRANSISTOR LEAD DESIGNATION

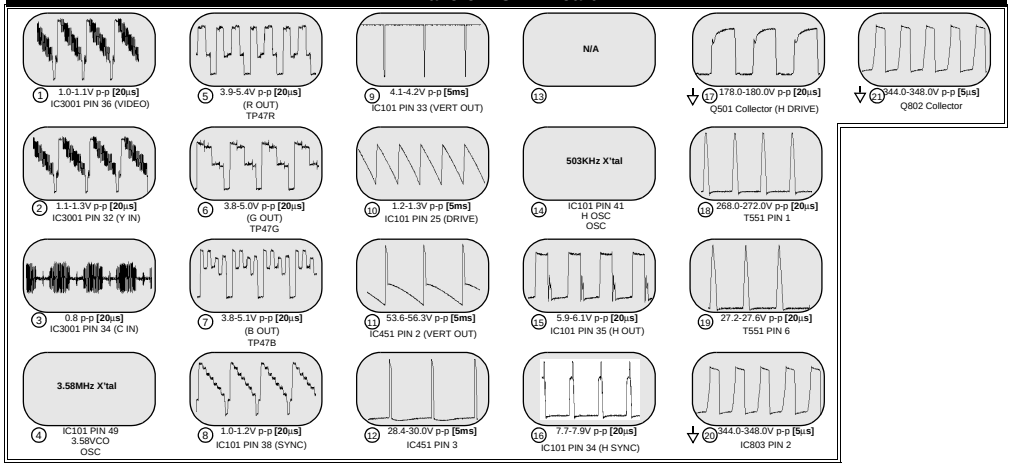
IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

Waveforms - A-Board


1 1.0-1.1V p-p [20µs] IC3001 PIN 36 (VIDEO)
5 3.9-5.4V p-p [20µs] (R OUT) TP47R
9 4.1-4.2V p-p [5ms] IC101 PIN 33 (VERT OUT)
13 N/A
17 178.0-180.0V p-p [20µs] Q501 Collector (H DRIVE)
21 344.0-348.0V p-p [5µs] Q802 Collector
2 1.1-1.3V p-p [20µs] IC3001 PIN 32 (Y IN)
6 3.8-5.0V p-p [20µs] (G OUT) TP47G
10 1.2-1.3V p-p [5ms] IC101 PIN 25 (DRIVE)
14 503KHz X'tal IC101 PIN 41 H OSC OSC
18 268.0-272.0V p-p [20µs] T551 PIN 1
3 0.8 p-p [20µs] IC3001 PIN 34 (C IN)
7 3.8-5.1V p-p [20µs] (B OUT) TP47B
11 53.6-56.3V p-p [5ms] IC451 PIN 2 (VERT OUT)
15 5.9-6.1V p-p [20µs] IC101 PIN 35 (H OUT)
19 27.2-27.6V p-p [20µs] T551 PIN 6
4 3.58MHz X'tal IC101 PIN 49 3.58VCO OSC
8 1.0-1.2V p-p [20µs] IC101 PIN 38 (SYNC)
12 28.4-30.0V p-p [5ms] IC451 PIN 3
16 7.7-7.9V p-p [20µs] IC101 PIN 34 (H SYNC)
20 344.0-348.0V p-p [5µs] IC803 PIN 2

Waveform Measurements

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

Medición de Formas de Onda

1. Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

PARTS LIST ABBREVIATIONS GUIDE

RESISTOR			
TYPE		**TOLERANCE**	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

RES, C 270-J-1/4

CAPACITOR			
TYPE		**TOLERANCE**	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
		L	± 15%
		M	± 20%
		P	+10% -0%
		Z	+80% -20%

CAP, P .068UF-K-50V

Panasonic®

Printed in USA
K01072223CM0731

Other ManualsLib Projects

www.manualslib.com

www.manualslib.de

www.manualslib.es

www.manualslib.fr

www.manualslib.nl

www.manualslib.mx

www.manualslib.tech 30+ Languages